the Science Library

OIL AND GAS JOURNAL

JANUARY 9
1941

JAN 10 1941

. . . for NEW drill pipe of all types and makes

. . . for reconditioning USED drill pipe of ALL kinds

Pressure-Weld

Trade Mark Registered

DRILL PIPE JOINTS

Economical
Any Style of Joint, including A. P. I.
Any Type of Connection
Any Oversize Dimension
Alloy Steel Working Threads
No Pipe Threads

SEND FOR FULL INFORMATION

HYDRIL COMPANY
General Offices: 714 West Olympic Blvd.,
Los Angeles, California
Factories: Torrance, Calif.; Houston, Texas; Youngstown, Ohio; Rochester, Penna.
Field Shops: Avenal, Calif.; Odessa, Texas

HYDRIL

PRICE
CENTS

Doing the Big Jobs Well

- **EMCO LARGE CAPACITY METERS**
- **EMCO BALANCED VALVE REGULATORS**

Large capacity meter and regulator installation using EMCO Meters with EMCORECTORS, EMCO Regulators and Nordstrom Valves. Note that piping manifold is constructed to accommodate additional meters for anticipated increase in load.

PRACTICALLY every kind of large volume gas measurement is being accomplished successfully, accurately, and at low cost by EMCO Large Capacity Meters—in industrial plants, bakeries, apartment houses, hotels, refineries, gasoline plants, at town borders for municipalities, on gas wells, and practically every metering service.

THE EMCORECTOR

EMCO Large Capacity Meters, fitted with the EMCORECTOR, give an accurate, direct reading of volume corrected to any base pressure, and eliminate the time and expense involved in making chart calculations.

When EMCO Meters are used on lines controlled by EMCO Balanced Valve Regulators and Nordstrom Valves, the combination provides the ultimate in measurement and control satisfaction.

FOR EXTREME PRESSURES

Use **EMCO HIGH PRESSURE METERS**

PITTSBURGH EQUITABLE METER COMPANY

MERCO NORDSTROM VALVE CO.

NEW YORK · BUFFALO · PHILADELPHIA · KANSAS CITY · TULSA · LOS ANGELES · *Main Offices* · PITTSBURGH, PA. · DES MOINES · CHICAGO · COLUMBIA · MEMPHIS · OAKLAND · HOUSTON

The Oil and Gas Journal

PUBLISHED WEEKLY BY THE PETROLEUM PUBLISHING COMPANY AT TULSA, OKLAHOMA

HOME OFFICE, 211 S. CHEYENNE, TULSA
PHONE 3-6291

P. C. LAUINGER, *President* — *Editor*, C. O. WILLSON

LYNN M. NICHOLS, *Managing Editor* — W. V. HOWARD, Ph.D., *Field Editor*

W. T. ZIEGENHAIN, *Refinery Editor* — W. L. NELSON, *Technical Editor*

Associate Editors

HARRY F. SIMONS — T. P. SANDERS
D. H. STORMONT — PAUL REED
H. STANLEY NORMAN — ROBERT INGRAM

District Editors

Houston, *617 Caroline St.*: NEIL WILLIAMS, F. L. SINGLETON
Fort Worth, *Petroleum Bldg.*: R. MARNE SANFORD
Shreveport, *City Bank Bldg.*: GEORGE WEBER
Los Angeles, *Union Oil Bldg.*: L. P. STOCKMAN
Washington, *Natl. Press Bldg.*: HENRY D. RALPH
Saginaw, *News Bldg.*: O. C. PRESSPRICH
Denver, *State Office Bldg.*: TOLBERT R. INGRAM
New York, *415 Lexington Ave.*: J. P. O'DONNELL
Oil City, *Derrick Bldg.*: A. C. MacINTYRE
Chatham, Ontario, *35 Stanley Ave.*: VICTOR LAURISTON

S. H. ROURKE, *Business Manager*

M. L. DURHAM, *Circulation Manager*

Advertising

E. KLAPPENBACH, *Vice President*

New York, *415 Lexington Ave.*: LLOYD CAIN
Cleveland, *Leader Bldg.*: HOWARD MARKT
Chicago, *105 W. Madison*: C. R. FARMER, KENNETH J. LANGLEY
Tulsa, *211 S. Cheyenne Ave.*: JAMES D. HUGHES
Houston, *617 Caroline St.*: WAYNE RIVES
Los Angeles, *1406 S. Grand Ave.*: J. HOWARD TINKHAM

Twickenham (Middlesex) England—*72 Cole Park Road*: A. J. CHAMBERS

Table of Contents

Vol. 39, No. 35 — January 9, 1941

News Developments

Trends: Situation in Texas Improves as Supply Reduced to Demand ... 7
Hawkins, East Texas, Discovery, Starts Drilling Campaign ... *R. Marne Sanford* 8
Nolo Contendere Pleas May End Madison Case ... 10
Illinois' Loss Aids Oklahoma ... *J. P. O'Donnell* 11
Sparks From the News ... 12
Ten Pay Levels Now Producing at Texas' Hull-Silk Field ... *R. Marne Sanford* 13
Northern Hemisphere Offers Greater Oil Possibilities ... *W. V. Howard* 14
News From the State Capitals ... 16
Editorial: The Immediate Task ... 17
I. C. C. Proposes Drastic Cuts in Pipe-Line Rates ... *Henry D. Ralph* 18
Oil Legislation Will Be Before Solons Within Four Months ... *Henry D. Ralph* 19
McHugh Heads Louisiana Minerals Department ... *George Weber* 20
Supreme Court Upholds Texas Proration in Two Decisions ... 20
Move to Regulate Recycling Operations in Texas ... 20
Stiffening of Crude Prices Noted on Many Fronts ... 22
Oil Industry and Federal Control Subject of Magazine Article ... 22
Deaths ... 22
International News ... 25
The Markets ... 26
Refinery Expansion ... 29
Natural Gas News ... 29
Natural Gasoline News ... 29
Programs and Meetings ... 30
Well Logs and Field Data of Active Oil Areas (Central San Joaquin Valley) ... 50
Pipe-Line Activity ... 53

Engineering—Operating

Shell Drills 8,200-Ft. Wells With Tubing in California ... *L. P. Stockman* 32
Admixtures and Chemicals Used in Drilling Fluids ... *Harry F. Simons* 34
Calculating Percentages in a Two-Component System ... *T. W. Brinkley* 37
Operating Ideas ... 40
Cetane Number and Chemical Composition ... *T. Y. Ju and C. E. Wood* 41
Safety: Longer Rathole Pipe Raises Drive Bushing ... 46
Questions on Technology ... *W. L. Nelson* 48

Field Developments

Field Developments ... 55
Kansas ... *Robert Ingram* 56
Forest City Basin ... 56
Oklahoma ... *Robert Ingram* 59
N. Louisiana, Arkansas ... *George Weber* 62
Southwest Texas ... *F. L. Singleton* 64
Permian Basin, Panhandle ... *R. Marne Sanford* 67
Texas Gulf Coast ... *Nell Williams* 70
California ... *L. P. Stockman* 72
Louisiana Gulf Coast ... *F. L. Singleton* 75
Illinois ... 76
Rocky Mountain Area ... *T. R. Ingram* 77
Eastern Texas ... *R. Marne Sanford* 78
Among Drilling Contractors ... 80
North Central Texas *R. Marne Sanford* 82
Michigan ... *Otto C. Pressprich* 84
Canada ... *Victor Lauriston* 85
Appalachian Fields ... 86
Indiana, Ohio, Kentucky ... 87
Mississippi ... *George Weber* 89

Markets and Prices

Group 3 Market ... *H. Stanley Norman* 92
New York Market ... *J. P. O'Donnell* 93
A.P.I. Refinery Report ... 93
Tank-Wagon Market ... 94
Refinery Prices ... 95
Crude-Oil Prices ... 99

Additional Features

Record of Oil Securities ... 96
Equipment News ... 97
Personal Paragraphs ... 90
Classified Advertising ... 98-99
Advertisers' Index ... 100

SUBSCRIPTIONS: United States, 1 year, $6.00; 6 months, $3.00. Elsewhere, 1 year, $7.00; 6 months, $3.50. SINGLE COPIES: 20 cents each. Back copies, when over a year old, 50 cents. CHANGES OF ADDRESS reaching the Tulsa office of the Journal by Saturday take effect with the following issue.

Copyright, 1941, by The Petroleum Publishing Company

WHY NOT?

These operators know from past experience that when this Baker Model "K" Cement Retainer is run to the desired setting point and packed off by hydraulic pressure it will "stay put"; that fluid can be put away under any pressures that can safely be applied to the casing in which the Retainer is set; that fluid can be bled off at any time during circulating or cementing operations (by-passing through the Baker Circulation Joint); that when the last of the cement or fluid has been placed and the "squeeze" applied, the Ball Back-Pressure Valve in the lower end of the Baker Model "K" Cement Retainer will function automatically and positively to prevent any return flow back through the Retainer; that, following the cementing operation, the running-in string (tubing or drill pipe) can be easily unscrewed from the Cement Retainer and removed from the hole; that when it is time to remove the Cement Retainer, it can be drilled up with minimum time and expense.

It is these important features that have been responsible for the successes of this remarkable tool, and by successes we mean thousands of successful jobs that have been completed to date with the Baker Model "K" Cement Retainer . . . jobs that in many instances have been real "life savers" for the well involved.

BAKER OIL TOOLS, INC.

MAIN OFFICE AND FACTORY
6000 So. Boyle Ave., Los Angeles, Calif.
Box 127, Vernon Station

Central Division Office and Factory:
P. O. Box 3048, Houston, Texas

Export Sales Office: 19 Rector Street, New York City

IMPORTANT

APPLICATIONS FOR THE BAKER MODEL "K" CEMENT RETAINER

Re-Cementing

Cementing Behind Sections of Pipe

Reducing Gas/Oil Ratios

Series Cementing

Plugging Off Bottom Fluids

Plugging Back to Upper Zones

Testing Upper Cased Formations

Squeeze Jobs

As a Heaving Plug

As a Bridge Plug at any Place in Casing or Liner

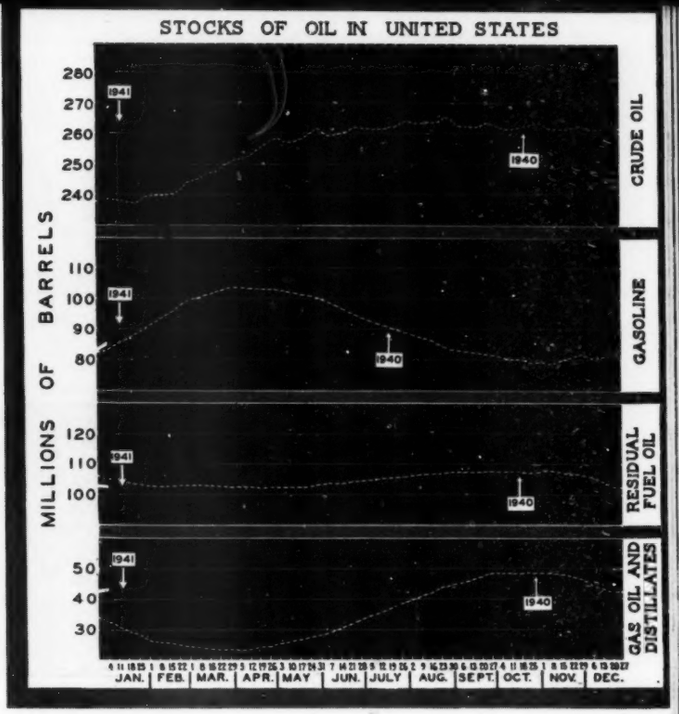
For complete details, refer to the Baker Section of your Composite Catalog, or inquire of the nearest Baker office or field representative.

BAKER
SAVE A WELL
CEMENT RETAINER

Baker Model "K" Cement Retainer with Circulation Joint and Circulation Joint Bottom Sub

Trends

Situation in Texas Improves as Supply Reduced to Demand



ANNOUNCEMENT of an additional shutdown day for Texas during January and indications of a break in the high tanker rates were Monday and Tuesday developments which should prove beneficial in an area where weakness has centered in recent weeks. The adding of 1 day—January 8—to the previous schedule of 9 shutdown days, practically assures that Texas crude production this month will be less than the B. of M. estimated demand. The application of this program, it is expected, will be reflected in better balanced operations in several areas where substantial quantities of crude are moving under the level of postings for the state generally.

CRUDE PRODUCTION *3,358,965 bbl. daily average—down 10,775 bbl. One year ago 3,587,114 bbl.*

CRUDE STOCKS *261,552,000 bbl. as of December 28—down 936,000 bbl. One year ago 237,742,000 bbl.*

GASOLINE STOCKS *85,053,000 bbl. as of January 4—up 1,779,000 bbl. One year ago 83,911,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *102,448,000 bbl. as of January 4—down 172,000 bbl. One year ago 105,239,000 bbl.*

GAS OIL AND DISTILLATES *42,403,000 bbl. as of January 4—up 137,000 bbl. One year ago 32,782,000 bbl.*

REFINERY RUNS *3,600,000 bbl. daily week ended January 4—up 15,000 bbl. One year ago 3,370,000 bbl.*

Predictions that the first of the year would witness a break in the high tanker rates were sustained Monday when it was announced that a clean tanker has been chartered for coastwise movement at 55 cents per barrel, a reduction of 15 cents under late December rates. The high tanker rates have been a direct factor in the general weakness of the Gulf Coast refinery markets. The smaller refiners have been unable to maintain the normal movement of their products and this fact has been reflected in the prices they could pay for crude oil. Changes of the past few days point to a better balance in supply and demand which if continued will have significance to all operators. Texas field interest centers in the Hawkins play of Wood County, East Texas, described in a feature article and field reports appearing elsewhere in this issue.

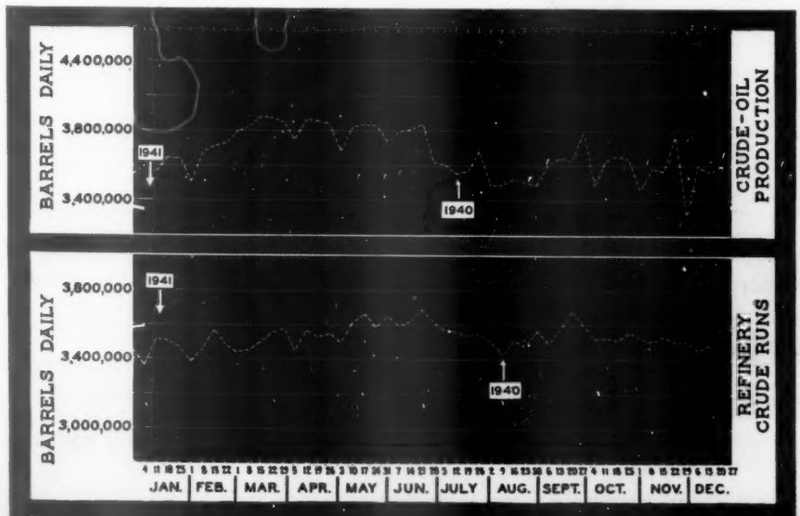
Interior market developments, east of the Rocky Mountains, continue to be favorable. The active solicitation of well connections in the middle western fields where the trend in production is downward with demands increasing,

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 4, 1941	Bur. Mines Jan. est. of demand	January state allowables	Dec. 28, 1940
Arkansas	69,135	66,100	70,666	68,525
California	600,300	594,800	571,000	604,500
Eastern fields	108,200	114,800	. . . . .	106,120
Illinois	326,100	340,300	. . . . .	323,200
Kansas	181,450	191,000	194,000	186,350
Louisiana	293,335	287,400	292,756	288,490
North Louisiana	*69,135*	. . . . .	. . . . .	*67,940*
Louisiana Gulf Coast	*224,200*	. . . . .	. . . . .	*220,550*
Michigan	41,840	46,100	. . . . .	42,145
Mississippi	14,930	15,200	. . . . .	15,060
Nebraska	2,320	2,000	. . . . .	3,200
New Mexico	103,530	100,000	104,000	104,020
Oklahoma	404,625	439,000	390,000	397,100
Rocky Mountain states	94,350	96,800	. . . . .	94,430
Texas	1,118,850	1,297,500	1,370,000	1,136,600
East Texas	*301,225*	. . . . .	. . . . .	*301,350*
West Texas	*174,320*	. . . . .	. . . . .	*181,600*
North Central Texas	*120,525*	. . . . .	. . . . .	*128,175*
East Central Texas	*76,680*	. . . . .	. . . . .	*80,025*
Texas Panhandle	*71,400*	. . . . .	. . . . .	*71,375*
Texas Gulf Coast	*295,950*	. . . . .	. . . . .	*298,950*
Southwest Texas	*78,750*	. . . . .	. . . . .	*75,125*
Total United States	3,358,965	3,591,000		3,369,740
Production January 1-January 4, 1941		12,876,435 bbl.		
Same period last year		14,348,456 bbl.		

brought a general advance of 10 cents per barrel in Michigan postings. In Illinois, the first of the year ended some of the contract arrangements in which crude oil had been sold under the posted schedules. With no new large fields in the offing, it is predicted that the Illinois crude market will tighten by early spring so that postings will be 15 to 25 cents per barrel above the general level of Mid-Continent crude schedules. This differential is justified in normal times as it covers the transportation differential between Mid-Continent and middle western crudes.

Refinery markets for practically all products ranging from kerosene to residual fuel oils were also stronger in the interior areas over the past week. The price trend is upward in these products in refinery, jobber and consumer sales. While gasoline prices generally are unchanged, the statistical position of the product is showing steady improvement in several areas. Inventories are lower than they were a year ago at many plants. January shipments are running ahead of January 1940.



Although there is definite evidence that the newly discovered Hawkins pool will not rival the great East Texas field in area or in ultimate recovery, the discovery of a field containing approximately 100 ft. of Woodbine sand in the East Texas area is of great interest. Only three wells have been drilled at this time, and of these one is stopped in an overlying sand.

Tank battery and separator installed for the townsite discovery of Rotondi 1 Cobb. Note the typical boomtown mud and water. The Hawkins high school may be seen in left background

Hawkins, East Texas, Discovery Starts Drilling Campaign

By R. MARNE SANFORD

HAWKINS, Tex., Jan. 7.—Literally thousands of oil men, spurred by the magic words "Woodbine sand" flocked to the small town of Hawkins in southeastern Wood County, eastern Texas, during the past week to participate in the greatest oil boom for the district since the early days of the giant East Texas field. Acreage prices soared as Hawkins entered its second week as the newest and possibly the most important oil discovery in the area in several years.

Hawkins is the typical boom town with its muddy streets; its thrown-together lunch stands, map stands, and land and lease offices, and its map-laden oil men and lease buyers roaming the sidewalks.

The play was set off about a month ago when a well 3 miles north of Hawkins indicated oil production from the Woodbine sand. Immediately speculation ran wild as to the possibility of another great Woodbine sand field for eastern Texas. Salt water drenched the oil output early in its testing stages and the speculation somewhat subsided. Not, however, until two other tests were started, one in the townsite of Hawkins and the other just a mile northwest of the town.

On Sunday, December 30, these two wells blew in for producers. The townsite well, S. J. Rotondi 1 Cobb heirs, was estimated at 2,000 bbl. daily. The well northwest of town, Manziel 1 Bell, blew in as a wild gasser. The fact that these two wells checked from 200 to 400 ft. higher on structure than the small oil and water discovery well 3 miles north of town immediately set off the bombshell.

Residents began preparing for the expected influx of both oil men and onlookers. It is estimated that some 30,000 to 40,000 persons, both speculators and participants, crowded the small town during the past week.

Lease trading immediately started and reports commenced filtering out of the numerous locations staked or permits which were being sought for immediate drilling. By the middle of the week Rotondi 1 Cobb, George Brewer Survey, in the center of the town, was officially gaged at 363.75 bbl. of oil in 3 hours, flowing through 1-in. choke on Tuesday, December 31. The well showed 0.4 per cent b.s. and w. and the oil was 29.5 gravity. Flowing pressures were 285 lb. on the tubing and 635 lb. on the casing, while the shut-in pressures were 600 lb. on the tubing and 710 lb. on the casing. The short 3-hour flow rated the well at 2,910 bbl. of oil daily, exceeding the early estimates.

Tops in the well were Nacatoch sand, 2,245 ft.; Pecan Gap, 2,954 ft.; Austin chalk, 4,075 ft.; Woodbine series 4,398 ft.; oil sand, 4,450 ft., and total depth 4,648 ft.

Meanwhile, Kinley Brothers, of Houston, Tex., world-famous wild-well fighters, and their crew, were called in to attempt to kill the wild gas flow from Bobby Manziel 1 Bell, 1 mile northwest of the town. The well was menacing property and offering a serious fire hazard. Locomotive engines on the railroad several blocks away were ordered by the Texas Railroad Commission to bank their fires and coast when passing the wild gas well. It was blowing an estimated 50,000,000 cu. ft. of gas daily.

After several days' work the well was brought under control last Sunday. It was completed as a

The S. J. Rotondi 1 Cobb, discovery well in the Hawkins townsite

25,000,000-cu. ft. gasser with the drill pipe being used as the flow string. The hole is bottomed at 4,363 ft. and there is but 100 ft. of surface casing in the hole. This fact adds to the hazard of killing the well, for should it be capped over the surface casing it is feared the gas pressure will break through the casing cement, come up around the outside, and crater the hole.

Meanwhile, Bobby Manziel 1 Morrison, Pollock Survey, 3 miles north of town, the original discovery well for the area, has been officially gaged. It made 144 bbl. of oil, net, in 24 hours. 80 per cent of the total fluid output being salt water. It was a full 24-hour pumping gage. Surface casing is cemented at 100 ft., 5½-in. at 4,898 ft., and production is through perforations in the upper part of the Woodbine section which showed saturation from 4,802 ft. to total depth.

Early Development

Bobby Manziel 1 Morrison was staked as a location the latter part of September 1940, and about the middle of October topped saturation in the Woodbine sand. The well was correlated some 529 ft. higher than surrounding failures and the chances for commercial production were given as better than fair. Early testing showed mostly salt water and for the following 4 weeks the well was plugged back, perforated, drilled out, and again plugged back, seeking the best zone of oil saturation in the more than 100 ft. of Woodbine sand drilled as prospective oil pay. It was while this well was in the testing stages that the two tests to the south were started.

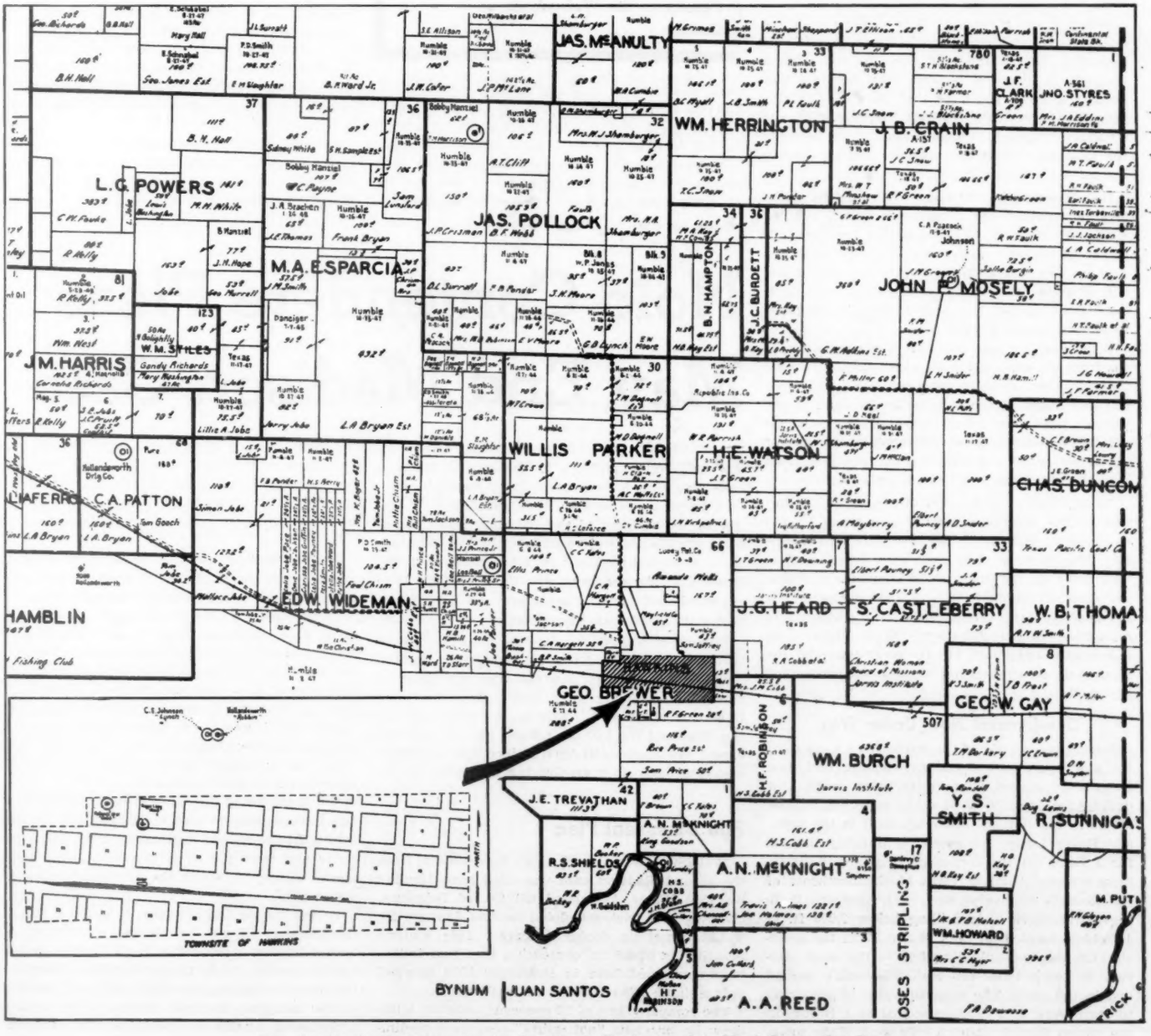
The tract on which 1 Morrison was drilled is a small, 62-acre tract in the western part of a several-thousand-acre block held by Humble Oil & Refining Co. The completion of the test has forced offsets on two sides by the Humble company.

At the time 1 Morrison was drilled it was thought to be on the northwest flank of the structure, the crest being about midway between the test and the town of Hawkins. Since its completion the geological picture has changed considerably, placing the probable top of the structure near the Cobb tract in the townsite.

There is not a great deal known of the geology of the Hawkins area at present, except that some sort of a large anticline is definitely present. This fact has been known for several years and was the reason for several failures being drilled at various points on what is now established as the flanks of the structure.

Several facts are now known which will greatly aid in drawing up the geological picture of the structure. A cross-section of the three wells already drilled best exemplifies this point. The Morrison well topped the Pecan Gap at 3,193 ft. The Rotondi discovery in the townsite topped this marker at 2,954 ft. Excluding slight elevation differences, this places the Rotondi well some 239 ft. higher on this marker. The Austin chalk was topped at 4,505 ft. in the original discovery by Manziel on the Morrison. It was topped at 4,214 ft. by Manziel 1 Bell, 2 miles to the south. This makes 1 Bell some 291 ft. higher on this marker. Going farther south and slightly east the Rotondi well topped the Austin chalk 430 ft. higher than 1 Morrison and 139 ft. higher than 1 Bell.

The differences between 1 Morrison and the Rotondi well of 239 ft. on the top of the Pecan



Map showing development and active locations in Hawkins pool, in Wood County, East Texas

Gap and 430 ft. on the top of the Austin chalk show a definite thinning between these two markers from north to south over the structure.

As for the top of the Woodbine section, it was called at 4,802 ft. in 1 Morrison. No. 1 Bell has not yet topped the Woodbine sand. The gas is coming from the sub-Clarksville sand, a member of the Eagle Ford shale which lies immediately above the Woodbine series. According to reports, and based, somewhat, on the fact that 1 Bell was 291 ft. higher than 1 Morrison on the top of the Austin chalk yet 139 ft. lower than the Rotondi well on the same marker, it is probable that it will continue to run about the same distance lower. Thus with its present depth of 4,363 ft. it can be estimated that it is about 175 ft. short of the Woodbine sand. Should this prove to be the case the Woodbine would be topped at about 4,540 ft.

With this top figured for the Woodbine in 1 Bell it is plain that it is about 260 ft. higher on the top of the Woodbine than 1 Morrison. These correlations aid in calculating that the amount of rise over the structure is about 136 ft. to the mile in a south direction from 1 Morrison.

Whether the Rotondi well is on the top of the structure is not known, that is from an east-west direction. That it must be near the top from a north-south direction is seen from the fact that about 1¼ miles south of the town of Hawkins is a failure at 5,330 ft. This indicates that the structure drops off at a considerable rate between the Rotondi well in the townsite and the failure 1¼ miles to the south.

It is too early in the field's development to determine whether the structure is round, oval, or long and narrow. It is believed that the structure is due to a deep-seated salt dome such as is the case at Van and at the recently opened Chapel Hill field in Smith County. Should the field resemble the Chapel Hill field it would be longest in a north-south direction.

Regarding the fact that 1 Bell is producing its gas from the sub-Clarksville sand and the reasons therefor, there is little yet known. No noticeable gas was found in the sub-Clarksville sand in the Rotondi well, even though it was higher on structure. This sand does not generally have gas or oil; however, some production was obtained from it in the old Camp Hill field in Anderson County.

As to 1 Bell's chances for obtaining oil production in the Woodbine sand if and when it does continue to this level, they are better than average. The Morrison well has been established as well down on the flank of the structure and near the oil-water contact. This is the reason for its low-gravity, dark crude. Since it is expected to encounter the Woodbine some 260 ft. higher than 1 Morrison and about 140 ft. lower than the Rotondi well, its chances for commercial production are good.

Development Now Under Way

During the middle of the week there were some six new operations definitely starting and locations were staked or permits were sought for drilling for some 30 to 35 other wells. As an east offset to the Rotondi discovery well in the townsite Roger Lacey, Longview, is building derrick for 1 Beck, on the corner of Beulah and Blackburn streets. About 2 town blocks northeast of the Rotondi discovery, Earl Hollandsworth Drilling Co., Longview, is drilling below 2,000 ft. at 1 Robbin, located on Lots 16 and 17 in the townsite. On the two adjoining lots to the west, derrick is being built for Hollandsworth's second test in the town. The same operator is preparing to start work at a location staked as 1 Bryan, in the Patton Survey, about a mile west of the town.

About 1¼ miles south of Hawkins, Walter Goldston, Houston, is building derrick for 1 W. J. Harrell, H. S. Cobb Survey. Some 2½ miles northeast of the town C. Johnson is building derrick for 1 J. M. Green, in the John P. Mosely Survey.

Numerous other tentative locations have been staked in the area, a great many of them in the townsite itself. In order to obtain an orderly program for drilling in the townsite, a petition carrying the signatures of 264 citizens in the Hawkins area was presented to the Railroad Commission requesting a hearing at Hawkins on January 10 for the purpose of drawing up a spacing pattern for the town lots and the surrounding area.

Following this united request for orderly drilling, the Texas Railroad Commission Saturday issued temporary rules for the field, pending a hearing January 20 in the Hawkins school house. Daily allowables of 150 bbl. each have been assigned the two producers already completed. A 20-acre spacing pattern has been set up which states that no well shall be drilled nearer than 933 ft. from another well and 468 ft. from a property line. All townsite locations are special grants and exceptions to spacing rule 37. Well allowables will be determined 75 per cent on acreage and 25 per cent on a well basis. A 1,200-ft. surface-casing program was also ordered by the commission.

Humble Oil & Refining Co., which has a large 13,000-acre block north of Hawkins and which is obligated to the extent of two offsets to 1 Morrison, the discovery well, is reported planning to establish an oil-field camp for its workers and start a full-scale development program for its acreage. The camp site is tentatively made on the L. A. Bryan lease a mile north of the town. This has not been confirmed; neither has Humble announced locations for either of its offsets to 1 Morrison.

Despite the fact almost every one of the tests now drilling or preparing to drill is technically a wildcat, little but optimism is felt by the majority participating in the play.

GEOLOGICAL CROSS-SECTIONS

In this issue, The Oil and Gas Journal commences its second series of well logs and field data of active oil areas. The first section is in the central part of San Joaquin Valley of California, extending from outcrops west of Coalinga to the world's deepest well at Wasco.

On January 23, there will appear a section across the north end of the Nemaha ridge in Nebraska from Lincoln to the Falls City area. A section from Tinsley to southeastern Mississippi will be published in the issue of February 6, while in the February 20 number, there will be a treatment of the southern part of the Illinois basin from Perry County to the Wabash River in White County.

Nolo Contendere Pleas May End Madison Case

DANVILLE, Ill., Jan. 7.—The trial of the remaining defendants in the second Madison case involving jobber contracts appeared improbable yesterday after the defendant Texas Co. and one of the officers of the company had entered pleas of nolo contendere in federal court. Charges were dismissed against two other officers of the Texas Co. The company was fined $14,000. It is expected that another company and its officers will enter nolo pleas this week.

Reports also indicated that the nolo plea would be made by several defendants who were granted new trials in the first Madison case involving refinery buying. The trial of these cases is scheduled to start at Madison this month. It is reported that the Standard Oil Co. of Indiana and its officials expect to stand trial in April on its original position that it had no part in any buying program.

File Dismissal Plea

MADISON, Wis., Jan. 7.—Plea for dismissal from the second Madison case was filed here Monday by Tide Water Associated Oil Co. of Delaware, claiming that trial, scheduled to start January 20, would constitute double jeopardy. Tide Water's pleading is based on contention that two indictments returned here in December 1936 charged only a single offense under the Antitrust Act.

The company, one of 23 concerns indicted, withdrew its previous "not guilty" plea as a preliminary to the new motion to be argued before Judge Walter C. Lindley. The Texas Co. is the only other defendant remaining to face trial here January 20 on a charge of unlawful combination to restrict profit margins of gasoline jobbers. All others either have paid fines without contest or have been dismissed.

During trial of the first indictment, charging substantially the same defendants with conspiracy to raise and fix gasoline tank-car prices. Tide Water's motion points out it was dismissed by the court as a defendant over its own objection. It has asked either that the court direct a verdict of not guilty or that the trial proceed to a jury verdict. Before this case came to trial, it was not in position to plead double jeopardy on the second indictment, it explained. However, in view of the dismissal it now claims trial on the second indictment would violate its rights under the fifth amendment to the Constitution.

While the grand jury alleged four offenses in the two indictments, the plea maintains that the three counts in the second indictment differ from each other and from the first indictment, only in the means alleged by which the conspiracy was to be effectuated.

In the "price fixing" case, it pointed out, the Government alleged the means constituted concerted buying programs to take distress gasoline off the market, while the three means, charged in the second case, allegedly were uniformly restricted jobber margins, uniform contracts and uniform practices in relation to commissions and other dealings with jobbers.

Illinois' Loss Aids Oklahoma

By J. P. O'DONNELL

OKLAHOMA has been the principal initial beneficiary of Illinois' inability to supply former domestic crude-oil markets, reports of the U. S. Bureau of Mines for the first 10 months of 1940 indicate. These reports reveal that Illinois has lost markets aggregating 120,000 bbl. per day and that Oklahoma has gained new markets totaling more than 98,000 bbl. per day as a result of Illinois' swift production decline.

Refinery demand for Illinois crude in the 10-state area which it partially supplied reached its peak in July when Illinois provided 34.6 per cent of the crude oil received at refineries in that area. Successive reductions since then brought Illinois' percentage of the total down to 24.5 per cent in October. At the same time, as indicated by the accompanying chart, Oklahoma increased its percentage of this market from a July low of 15 per cent to 23 per cent in October.

In its best month of the current year, Illinois was supplying crude oil to refineries in Illinois, Indiana, Kentucky, Michigan, New Jersey, New York, Pennsylvania, West Virginia and Canada. During the first 5 months of 1940 it was also supplying 23,000 bbl. monthly to Missouri. All the other states were still taking Illinois crude as late as October but with the exception of New York and West Virginia, in substantially reduced quantities. Refinery receipts of Illinois crude in this area dropped from 12,459,000 bbl. in July to 8,890,000 bbl. in October, while receipts of Oklahoma crude in the same area rose from 5,417,000 bbl. in July to 8,364,000 bbl. in October. The volume of Illinois losses and Oklahoma gains by states is shown in Table 1.

TABLE 1—CHANGES IN STATES' RECEIPTS

(Thousands of barrels)

State	Illinois crude			Oklahoma crude		
	July	Oct.	Change	July	Oct.	Change
Illinois	4,740	3,670	—1,070	545	1,333	+788
Indiana	1,168	190	—978	2,423	3,905	+1,482
Kentucky	578	389	—189	0	177	+177
Michigan	559	365	—194	0	185	+185
Missouri	0	0	0	424	447	+23
N. J.	419	20	—399	532	171	—361
N. Y.	544	627	+83	0	0	0
Ohio	4,176	3,460	—716	575	1,156	+581
Pa.	209	89	—120	854	946	+92
W. Va.	66	80	+14	64	44	—20
Total	12,459	8,890	—3,569	5,417	8,364	+2,947

Refineries in the State of Illinois took a total of 6,480,000 bbl. of crude oil in the month of July, 4,470,000 bbl. of which were supplied from the state's own fields and 1,740,000 bbl. of which came from other states, notably Texas and Oklahoma. Illinois supplied 73 per cent of her own requirements in that month. In October, however, when Illinois refineries took 6,523,000 bbl., Illinois supplied but 3,670,000 bbl. of that amount or slightly more than 56 per cent. The principal beneficiaries of this situation were Oklahoma, 788,000 bbl., and Kansas, 304,000 bbl.

TABLE 2—ILLINOIS REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Illinois	4,740	3,670	—1,070
Kansas	34	338	+304
Louisiana	15	18	+3
New Mexico	369	462	+93
Oklahoma	545	1,333	+788
Texas	722	583	—139
Others	55	119	+64
Total	6,480	6,523	+43

Illinois supplied 1,168,000 bbl. of the 6,342,000 bbl. required by Indiana's refineries in July, or 18.4 per cent of their total requirements. By October, however, Illinois fields provided only 190,000 bbl. of Indiana's total of 6,736,000 bbl. or but 2.8 per cent. The changes in Indiana refineries' sources of crude-oil supply in this short period are shown below:

TABLE 3—INDIANA REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Indiana	69	79	+10
Illinois	1,168	190	—978
Kansas	1,980	1,557	—423
Oklahoma	2,423	3,905	+1,482
Texas	369	443	+74
Others	333	562	+229
Total	6,342	6,736	+394

Kentucky, like both Illinois and Indiana, replaced much of the market supplied previously with Illinois oil by increased receipts of Oklahoma crude though internal production was also benefited. In July, Illinois supplied 50 per cent of Kentucky refineries' crude-oil requirements and by October this proportion was down to 33 per cent as is shown in the following table:

TABLE 4—KENTUCKY REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Kentucky	328	451	+123
Illinois	578	389	—189
Oklahoma	0	177	+177
Others	248	172	—76
Total	1,154	1,189	+35

Michigan likewise drew upon Oklahoma to supply sources lost when Illinois declined and, as in Kentucky, this also stimulated demand for internally produced crude oil. In July, Illinois was supplying 27 per cent of the Michigan refineries' demands and this percentage was down to 18 per cent by October. Oklahoma benefited accordingly by providing 9 per cent of the October Michigan demand against none in July.

TABLE 5—MICHIGAN REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Michigan	1,494	1,509	+15
Illinois	559	365	—194
Oklahoma	0	185	+185
Total	2,053	2,059	+6

New Jersey refineries' demand dropped approximately the amount of the Illinois loss in October from July, but in the readjustment of sources of supply "other" states and Texas benefited most, the former rising 226,000 bbl. and the latter 131,000 bbl. This is one of the two instances in which Oklahoma also suffered losses.

TABLE 6—NEW JERSEY REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Illinois	419	20	—399
Louisiana	579	622	+43
New Mexico	337	341	+4
Oklahoma	532	171	—361
Texas	3,045	3,176	+131
Others	231	457	+226
Total	5,143	4,787	—356

New York refineries' sources of supply were substantially unchanged in the aggregate though a curtailment of operations by eastern New York refineries curtailed receipts of Texas crude and an expansion of operations by western New York refineries increased receipts of Illinois crude. All Illinois crude processed in this state is by western refineries.

TABLE 7—NEW YORK REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
New York	304	297	—7
Illinois	544	627	+83
Texas	569	396	—173
Others	73	56	—17
Total	1,490	1,376	—114

The major change in Ohio refineries' sources of supply was from Illinois to Oklahoma. The supply of Illinois crude oil dropped from 83.6 per cent of the total in July to 72.4 per cent of the total in October and at the same time Oklahoma's share of Ohio crude receipts rose from 11 per cent in July to 24 per cent in October.

TABLE 8—OHIO REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Ohio	148	136	—12
Illinois	4,176	3,460	—716
Louisiana	1	1	0
Oklahoma	575	1,156	+581
Others	91	23	—68
Total	4,991	4,776	—215

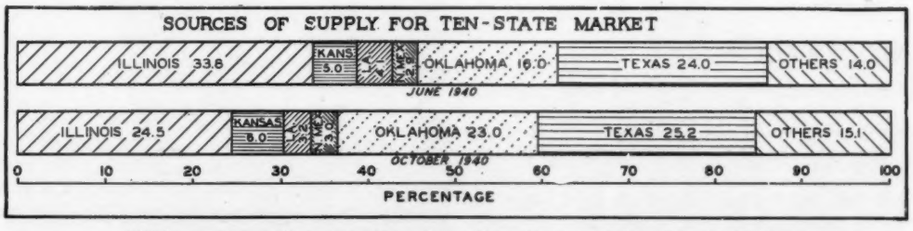
Even in July the role of Illinois crude oil in Pennsylvania refining was minor so that the loss of that source of supply had a minor effect on Pennsylvania sources in general. Receipts of Oklahoma crude oil were increased by Pennsylvania refineries, but the gain in demand for Texas crude far outstripped the Oklahoma gain. All Illinois crude used by Pennsylvania refineries was processed in refineries in the eastern area.

TABLE 9—PENNSYLVANIA REFINERIES' SOURCES OF SUPPLY

(Thousands of barrels)

Source—	July	October	Change
Pennsylvania	1,220	1,256	+36
Illinois	209	89	—120
Louisiana	691	542	—149
New Mexico	335	245	—90
Oklahoma	854	946	+92
Texas	3,871	4,449	+578
Others	102	131	+29
Total	7,282	7,658	+376

From July to October the interstate movement of Illinois crude oil dropped from 7,719,000 bbl. per month to 5,220,000 bbl. while intrastate receipts dropped from 4,740,000 bbl. to 3,670,000 bbl., a decline of 3,569,000 bbl. in domestic United States shipments. However, indications are that this has been offset at least to a minor degree by increased exports. Exports, calculated by subtracting domestic shipments from production after correcting the latter for changes in stocks, were up to 1,952,000 bbl. in October from 1,649,000 bbl. in July.



Oklahoma increased its percentage from 16 to 23 per cent from June to October

SPARKS . . . FROM THE NEWS

CURTAIN: Reports the first of the week indicated that the curtain is about to be finally lowered in the Madison case with pleas of nolo contendere by the remaining defendants. One company may insist on a trial.

FINAL WASH: The U. S. Supreme Court Monday reaffirmed principles announced in a previous case, washing its hands as to federal court consideration of alleged violation of property rights in application of conservation in the East Texas field.

AFTER TEST: Technologists are always finding something to test and now they are working on an instrument that will measure the density of the smoke after it is exhausted by diesel engines. The test is practical and it not only indicates the suitability of the oil but the condition of the engine.

THE CRUSHER: Something is bound to yield soon as the millstone of higher crude prices and record-low returns for gasoline keeps grinding.

INDICATIVE: Indicative of 1941 for western Kansas is the leasing of more than 2 million acres in three counties, including an adjoining area in Nebraska.

PIPE-LINE STORY: Reports on the pipeline movement of crude oil tell the story of the advance and decline of Illinois production. The pipe-line shift right now is back to the Mid-Continent.

IMPORTANT VICTORY: No oil is directly involved in Italy's rout in Libya, but the British victory means much in its continued control of the supplies of Iraq and Iran.

WHILE WAITING: While refiners wait for improvement in gasoline, their principal product, many have been able to boost their quotations slightly on the heavier products in response to a large seasonal demand.

IS IT CATCHING? The school at Hoodville, Ill., has been closed for 30 days while a test for oil is being drilled on the school yard. The children say it's more fun than measles and the parents hope it will bring tax relief.

ACE IN THE HOLE: Hunton lime production turned out to be an ace in the hole for the Coyle pool in Payne County, Oklahoma. Wells plugged back from the Wilcox sand in many cases are recompleted for higher potentials than when they first came in.

GOVERNMENT SUPERVISION: The oil companies built nearly $10,000,000 worth of pipe lines to serve the Salem field while its production was increasing. The Illinois-Iowa Power Co., after many delays, was granted permission last week to build a $29,000 electrical transmission line.

WIDENING MARKETS: Good news for many refiners in Louisiana and Texas Gulf Coast is the indication of a break in the tanker rates. Their markets widen as these rates go down.

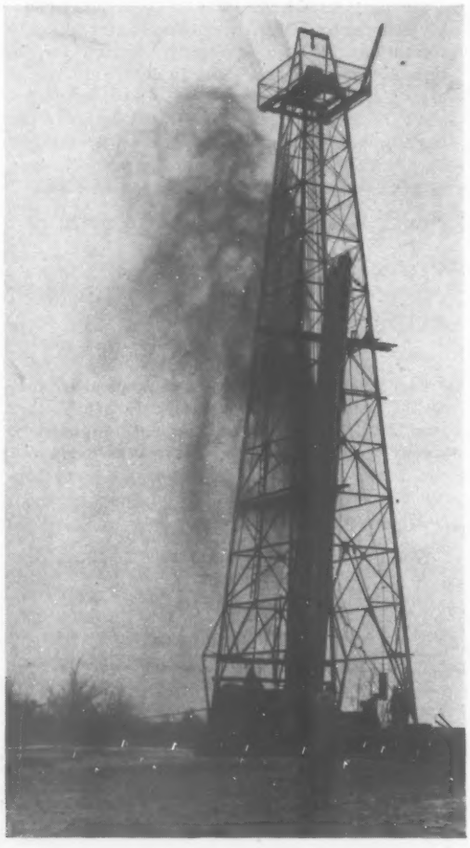
ROUND TRIP: Many Texas operators who participated in the Illinois boom are now back in the Lone Star State watching developments in the Hawkins play of Wood County.

GOVERNMENTAL COOPERATION: The Defense Commission wants more pipe lines. The I.C.C. proposes an arbitrary ceiling on earnings, thus ending the incentive for further construction.

GOOD START: The first act of the reorganized Texas Railroad Commission was to add another shutdown day for January, thus assuring that the state's excess production will end.

ATTENTION TEXAS: Michigan producers are receiving the highest crude prices in 3 years. Premiums for Illinois crude are spreading. This shows what happens when overproduction ends.

1941'S OPENER . . .

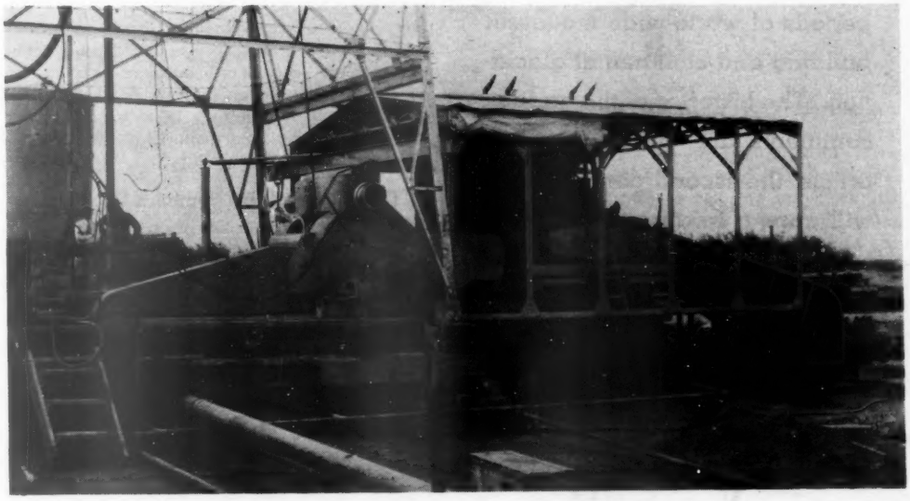


Manziel 1 Bell, near Hawkins, Wood County, Texas, blowing an estimated 50,000,000 cu. ft. of gas from the sub-Clarksville zone. The gasser was brought under control on January 5, being completed for 25,000,000 cu. ft. daily. This well was to be the third test of the Woodbine sand in the newly discovered Hawkins pool

Ten Pay Levels Now Producing At Texas' Hull-Silk Field

By R. MARNE SANFORD

WICHITA FALLS, Tex.—The discovery several weeks ago of a new and prolific producing horizon at 4,563 ft. marked the opening of the tenth pay level for the Hull-Silk field of northern Archer County, North Texas. The field was discovered by L. V. Hull and W. W. Silk 1 Wilson, NW NW SE Section 25, A.T.N.C.L. Survey, in March 1938 in the 3,800-ft. sand of Strawn age. In the comparatively short time of 2½ years since the first well, additional pay zones at 464 ft., 962 ft., 1,403 ft., 1,627 ft., 4,000 ft., 4,300 ft., 4,700 ft., 5,200 ft., and the newest at 4,563 ft., have been opened to production.



Drilling well in the Hull-Silk field. Note all equipment mounted on skids

The newest pay-level discovery was Peterson & McCarthy 36-B Wilson, O'Riley Survey, on the west side of the field. Some shows of oil were logged in the basal Strawn from 4,543-59 ft., however, the zone was conceded noncommercial and deepening was scheduled. In going an additional 6 ft., the well logged more pay and kicked off to flow commercially. It was completed for a daily initial of 1,246 bbl. from a total depth of 4,565 ft. This new pay level greatly enhances the prospects for the west and southwestern sides of the field, most of the multipay spots being heretofore on the northeast side of the field.

Hull-Silk is one of the first deep fields opened in North Texas and was instrumental in initiating the now active Fort Worth basin play in counties farther to the east and south. The field is about 9 miles southeast of the K.M.A. field and is about 6 miles southwest of the city of Wichita Falls.

Hull-Silk is located on a northeast-southwest plunging anticline with several hundred feet of closure in the lower strata. The majority of the various pay levels, with the exception of the 3,800-ft. and the 4,300-ft. are of the lenticular sand type or modified stratigraphic traps of various natures. The two main sand pays of the field are apparently consistent and widespread markers for the area.

The numerous pays are distributed throughout the four series of the Pennsylvanian age rocks. With only a relatively thin Permian deposit on the surface in the north part of the county, the first pay at 464 ft. is in the upper Cisco series. The other of the shallow pays, none of which has been identified definitely, are distributed throughout the lower Cisco and the Canyon series. The 3,800-ft. and 4,300 ft. pays are of Strawn age. The deepest zone in the field is producing from the Caddo lime of the Bend series. To date no production has even been sought in the Ordovician. Either the Simpson series or the Ellenburger series of Ordovician age may yield production, the Ellenburger having been found productive below the regular pay of the K.M.A. field about a year ago. Prospects are also seen for developing a Mississippian lime producing level, which has been found at various points throughout the district between the basal Pennsylvanian and the top of the Ordovician. In most parts of the district the Mississippian lime is believed absent, the Pennsylvanian lying unconformably on the Ordovician.

At the present time there are some 500 wells in Hull-Silk and the field has a daily allowable production in excess of 10,000 bbl. There are and have been for almost 2 years, some 40 active operations in the field at all times. Steady development at the rate of 15 to 20 new completions per month is predicted for at least a year to come.

Characteristic of this multipay field is the fact that in no case does more than one producing horizon yield from a single well. The Texas Railroad Commission regulations allow any number of pay sands to be produced from one hole, provided each is produced through a separate string of casing. It is this requirement that stops the multisand completion of wells in the field. Operators have learned that it is much more economical and efficient in the long run to drill a separate hole for each pay level rather than risk damage to the well by attempting to clean out and rework one of the minor horizons.

Types Equipment Used

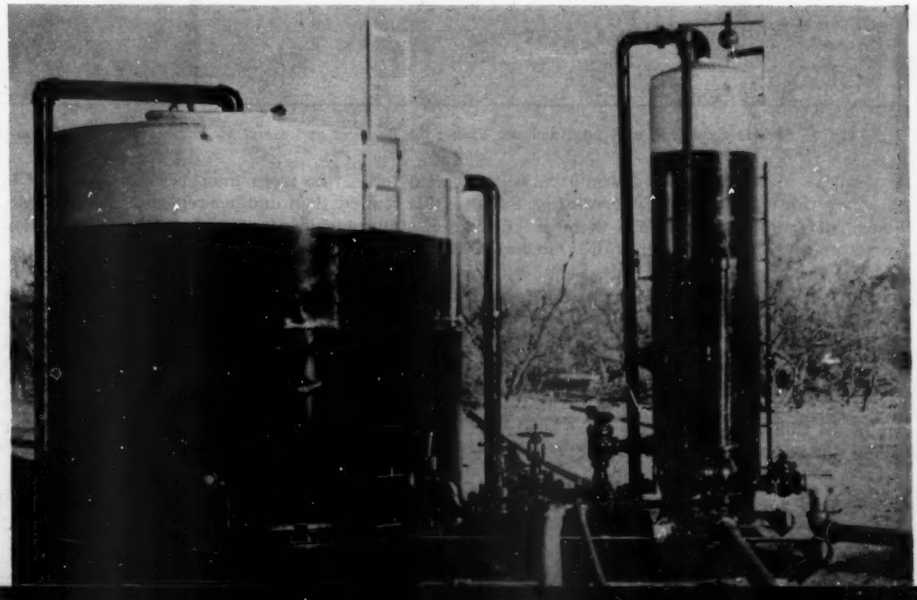
The fact that several of the producing zones at Hull-Silk yield flowing wells and others yield pumping wells somewhat complicates both the drilling and producing practices of the field. The standard type equipment for 3,800 and 4,300-ft. wells, and also for the three deeper levels, is all-butane or diesel-powered rotary rigs. Most equipment is mounted on skids as the extremely flat topography affords minimum difficulty in skidding heavy material from one location to another.

The only drawback to the skidding procedure is the extremely heavy growth of mesquite. This is cleared in uniform swaths of about 200 ft. in width through the field at uniform intervals by large bulldozers. Later when the wells are drilled and completed the cleared path is graded, oiled, and becomes a very efficient oil-field road.

Unlike several of the large North Texas fields which have some measure of difficulty in obtain-

(Continued on Page 26)

A 150-bbl. tank and 125-lb. working pressure separator unit used for drilling-in with oil



Northern Hemisphere Offers Greater Oil Possibilities

By W. V. HOWARD

The oil possibilities of the major subdivisions of the earth's surface can best be appraised in the light of certain major events in the earth's history. These include periods of world-wide mountain building and continental glaciation. The histories of the various continents are outlined in this article, the second part of which will appear in an early issue.

THE world's oil production can be divided into three nearly equal parts on the basis of geographical and geological distribution of the reservoirs. These are (*a*) Tertiary production of North America, (*b*) Tertiary production of the rest of the world, and (*c*) Mesozoic and Paleozoic production of North America. In considering the potentialities of the rest of the world, the first question that comes to mind is whether pre-Tertiary oil is confined to North America or whether it has not been sought as efficiently elsewhere. Then, on analyzing North American Tertiary production, one realizes that it comes from three types of structure, the California type of structure, the salt domes of the Gulf Coast, and minor structures and trends in nearly horizontal sediments along the Gulf Coast. Only the two first-mentioned classes of structure are important producers outside of the United States.

To assume that more than half of the world production comes from areas whose distribution is localized to North America would imply that there are two types of geology, one in the United States and another throughout the rest of the world. It would also imply that the chemical reactions which led to the formation of oil were confined to the United States until the Tertiary period when they became universal. A rather different assumption, namely that other areas also have the oil but have not yet been able to find it, would lead to one of two alternatives, either that there were two types of geologists, one in the United States and the other elsewhere, of else that market demands in the United States had forced the more intensive search for oil in this country than in other regions. The true state of affairs includes a part of all these possibilities.

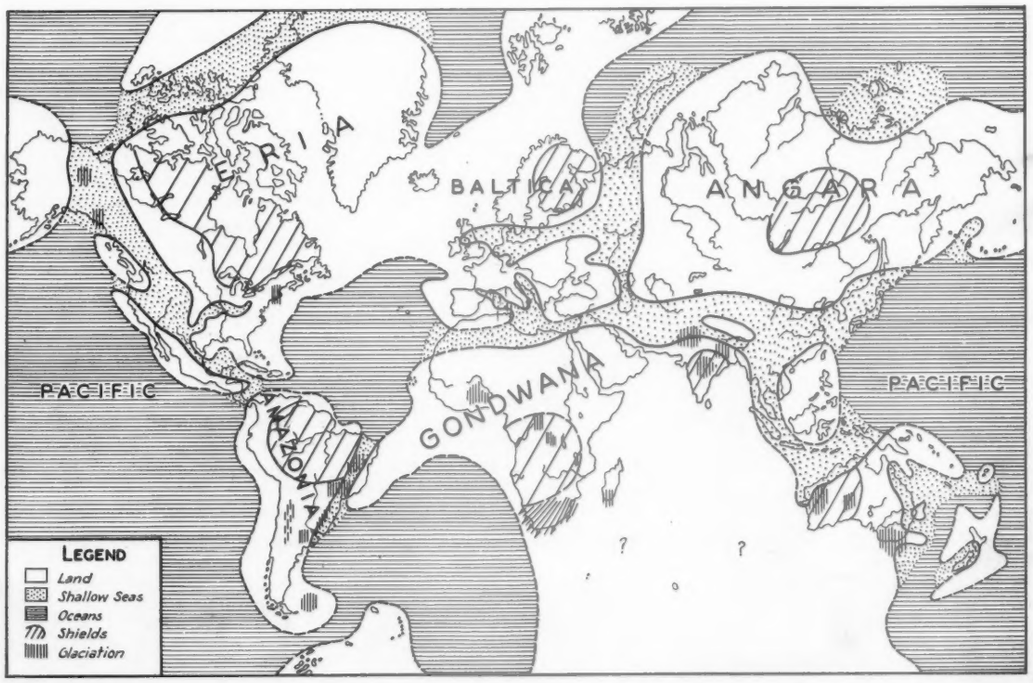


Fig. 1—Showing distribution of land and sea during the Permian and extent of Permian glaciation (after Schuchert)

Northern and Southern Hemispheres

It is customary to think of the globe in terms of an eastern and a western hemisphere. Geologically, it is preferable to consider it as made up of a northern and a southern hemisphere. Both hemispheres contain three central masses with surrounding bodies of land or water. The Atlantic Ocean traverses each hemisphere but it did not always separate America from the eastern continents. Either the continents have drifted apart or the ocean basin has foundered. Both hemispheres contain the remnants of a continent which extended some two-thirds of the way around the world, being bounded at each end by the Pacific Ocean which appears to be our one permanent ocean.

Essentially, both hemispheres contain the same elements, namely three large and some smaller shields of pre-Cambrian and other metamorphosed rocks surrounded by shelves composed of relatively undisturbed sedimentary rocks and a number of elongated, arcuate chains of highly folded rocks. When considered in more detail, there are differences between the two great continental areas which have a definite bearing on the possibility of finding oil, particularly of Mesozoic and Paleozoic age (Fig. 1).

Fragments of the Southern Continent

The southern hemisphere consists of five large fragments of a former continent which extended through a long period from New Zealand across Africa to the Andes, together with innumerable smaller fragments. The large fragments form the present continental masses of Australia, Peninsular India, Africa with Arabia, South America and Antarctica. The northern margin of this continent is formed by a series of mountain chains extending from the Atlas Mountains of Africa to the island arcs of the Netherlands East Indies. The Andes form the western border and the mountain ranges of New Zealand and eastern Australia form the partially submerged eastern rim.

The pre-Cambrian rocks which form the central masses around which the southern continent was built and which have formed positive areas which have not been submerged below sea level except for relatively short periods include most of Brazil, the Guianas and southern Venezuela, a large part of Central Africa, and western Australia. A great part of India is also made up of the same rocks. Whether Antarctica also has a large central shield is not known at present, but the thick ice cover makes that continent one in which interest is entirely academic at the present time.

Glaciation of the Southern Hemisphere

As in the Mid-Continent area of the United States, a large shelf of varying width surrounds these shields. This shelf oscillated above and below sea level during the Paleozoic and sediments were deposited on it. Doubtless structural features developed analogous to the Hunton arch, the Ozarks and other major uplifts. However, near the close of the Paleozoic the greater part of the continent was covered by ice sheets whose

size dwarfs the Pleistocene glaciation which covered some 3,000,000 sq. mi. of North America. Deposits of unsorted and unstratified glacial till buried the underlying rocks after leveling off many, if not most of the topographic features. Interstratified with the glacial till or boulder clay were interglacial continental deposits consisting of sands and clays, and following the glacial epoch great thicknesses of continental deposits continued to be laid down.

The effect of this glaciation was to mask practically all of the pre-Pennsylvanian rocks and structures and to make wildcatting doubly hazardous because of the necessity of searching first for structures below a cover which does not reflect the buried structures. Then, of course, there is always the possibility that at the point drilled there is not only no structure, but there is not even any sedimentary rock which could form an oil reservoir.

When it is remembered that geophysics has not contributed greatly to the discovery of oil fields in Michigan where the glacial drift makes interpretation of the results of geophysical prospecting very difficult, it can be seen that present geophysical methods cannot be counted on to penetrate the thick series of indurated continental and glacial sediments of Carboniferous and Triassic age in the southern continent. Therefore the chances of finding pre-Pennsylvanian oil deposits are reduced to a minimum over one-half of the earth's surface.

Break-Up of the Southern Continent

During the Triassic, the southern continent began to break up. Whether it did this by breaking into fragments which drifted apart or by wholesale foundering is immaterial to the occurrence of oil. The writer inclines to the theory of collapse by down-sinking of large portions of the crust so that his discussion of events will naturally lean in this direction. However, proponents of the theory of continental drift can consider that in their course over the earth's surface, the edges of the floating continents become submerged beneath the sea just as easily as if they had remained fixed, except for up-and-down vertical movements.

The first break of any consequence split the southern hemisphere into two parts with Madagascar, India and Australia becoming separated from the remainder. Then during the Jurassic—after the appearance of birds—New Zealand became permanently separated from Australia. Australia became separated from the rest soon after and, finally the land bridge connecting Madagascar and India collapsed leaving an island-dotted ridge as the only remnant of the connection.

The breaking away of South America began in the Jurassic and was completed by the beginning of the Tertiary.

The breaking up of Africa still continues, the great Rift Valley, containing the Nile and most of Africa's lakes, and the Jordan Valley in Palestine being downbreaks of comparatively recent age.

Adding to the difficulty of discovering oil in the Lower Palezoic are three great outpourings of basaltic lava which spread over large areas, 450,000 sq. miles in the Parana Basin of southern Brazil and Uruguay, 330,000 sq. miles in West Central Africa and 200,000 sq. miles in India were covered by a succession of sheets of lava totaling up to 2,000 ft. in thickness.

Marginal Marine Invasions

Following the breaking up of the southern continent, the sea lapped up onto the margins of the fragments remaining exposed. The Amazon Valley was occupied by an arm of the sea and the whole of North Africa was also submerged. In these areas, there are opportunities for discovering structures similar to those in Wyoming where Mesozoic sediments of widespread occurrence contain important quantities of oil. In the case of the Amazon Valley, however, structures that might exist are covered by alluvium deposited by the river as well as a thick tropical jungle soil.

In North Africa, the predominant formation exposed at the surface is the Nubian sandstone which has broken down to a sand which is drifted over the Sahara desert and masks many of the structures.

Thus, it is practically only around the margins of the fragments of the southern continent that there are good possibilities for production. Here, in places there are strips of Mesozoic and Tertiary sediments which are folded into gentle structures or form wedge edges and possible stratigraphic traps for oil. The small extent of these marginal masses does not, however, preclude the possibility of important deposits. Comodoro Rivadavia in Argentina and the Egyptian fields already produce from such areas and oil seepages are known to occur at many points around the margins of Africa, Palestine and Arabia.

Surrounding the southern continent on the west and north are great folded belts which have been welded on to the southern continent as a result of mountain building. It is in these belts that most of the oil of the southern hemisphere has been found. They are discussed here under the heads of Andine and Alpine Mountain systems.

Structure of the Northern Hemisphere

The northern hemisphere resembles the southern in certain respects. In the first place, it has three principal central shields, the Laurentian shield in Canada, Finland and Scandinavia (Fenno-Scandia) in Europe and a large area extending to the north and east from Lake Baikal. There have also been collapses of large areas followed by enormous outpourings of basalt, an area of 250,000 sq. miles in the northeastern United States, an area of unknown but comparable size in Siberia and a third area which is unique in that it foundered again after the basaltic eruptions leaving only scattered remnants in the present North Atlantic Ocean. These remnants are Iceland and other islands in the North Atlantic, the Tertiary basalts of eastern Greenland and western Scotland and Ireland.

There are several essential differences between the northern hemisphere and the southern. In the first place there was no late Paleozoic glaciation which masked the earlier-deposited sediments and the Pleistocene glaciation was largely confined to the areas occupied by the shields which would not yield oil regardless of structure. Second: the mountain bulding which welded a relatively narrow strip on to the margins of the southern continent was not only duplicated in the north, but it was preceded by another revolution or period of mountain building which was even more extensive and added a very much

(Continued on Page 26)

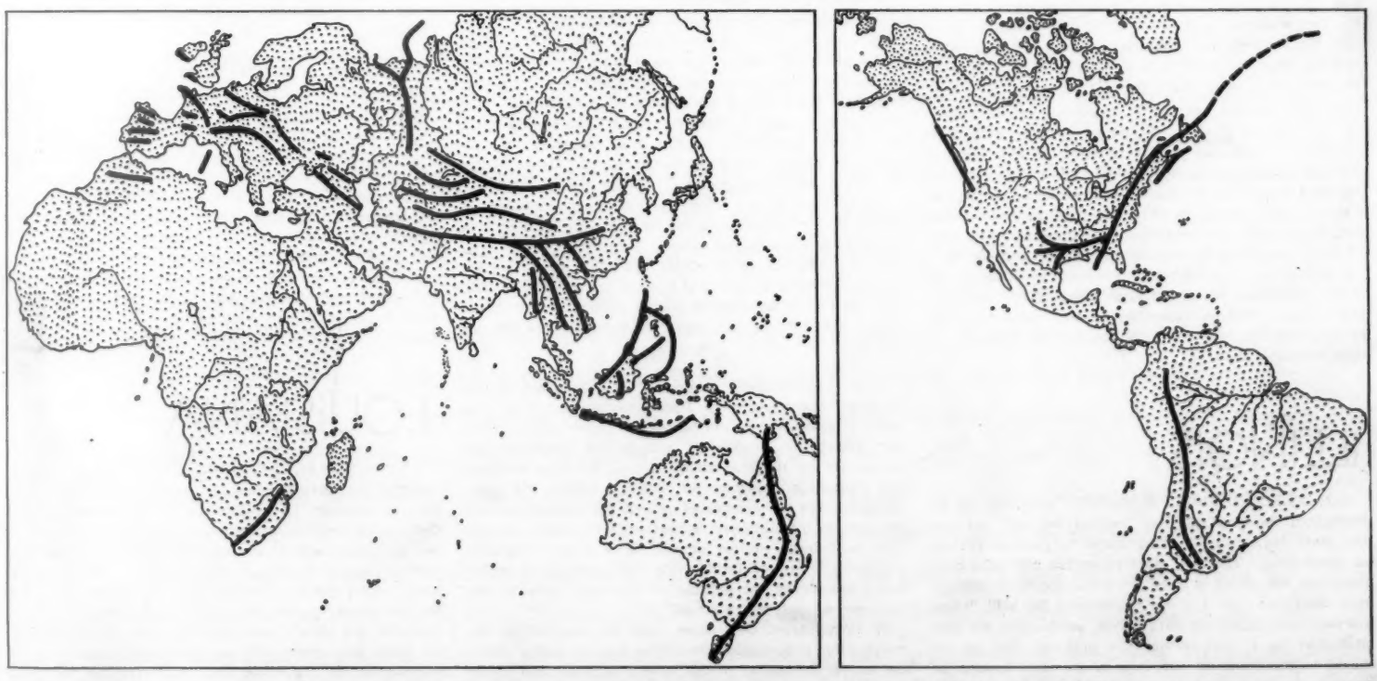


Fig. 2—The Appalachian-Hercynian orogeny showing distribution of principal mountain chains (after Schuchert)

STATE CAPITALS...

KANSAS

THE STATE CORPORATION COMMISSION has set Kansas' allowable oil production for January at 194,000 bbl., an increase of 1,600 bbl. over the state's December permissible production. Theo A. Morgan, conservation director, said the commission adopted the Bureau of Mines market-demand estimate of 191,000 bbl. for currently producing wells and added 3,000 bbl. daily for new wells completed during January.

Net November allowables and net January allowables, in barrels, of the larger fields were shown as follows: Ainsworth (Arbuckle), 36,539 and 34,626; Bemis, 260,161 and 279,768; Bloomer (Arbuckle), 117,787 and 127,358; Bornholdt, 115,650 and 130,852; Burnett (Arbuckle), 176,683 and 203,739; Burrton (chat), 168,113 and 205,884; Burrton (Hunton), 43,895 and 50,072; Chase (Arbuckle), 136,171 and 157,582; Coralena (Arbuckle), 28,580 and 31,941; Edwards, 47,709 and 50,862; Geneseo, 111,431 and 113,357; Gorham (Lansing-Kansas City), 79,966 and 98,583; Graber (Hunton), 70,220 and 79,552; Hall-Gurney (Lansing-Kansas City), 178,152 and 197,872; Hittle (Arbuckle), 964,491 and 210,173; Kraft, 32,822 and 38,288; Lost Springs, 35,004 and 44,307; Richardson, 38,643 and 41,022; Ritz-Canton, 96,355 and 131,378; Russell (Arbuckle), 30,051 and 31,533; Silica (Arbuckle), 370,392 and 381,360; South Silica (Arbuckle), 86,118 and 81,949; West Silica (Arbuckle), 42,349 and 44,581; Stoltenberg, 86,932 and 110,324; Sullivan (Gorham), 84,439 and 89,832; Trapp (Arbuckle), 385,394 and 414,603; Voshell, 46,881 and 55,036; Walters (Arbuckle), 30,053 and 33,527; Wellington, 36,969 and 54,644; Wherry, 111,108 and 133,108; Wilkins, 36,987 and 40,234; Zenith, 174,277 and 197,174.

The schedule listed a total of 20,673 wells with a potential of 7,110,498 bbl. This included 6,617 prorated wells with a potential of 7,068,002 bbl. and 14,056 wells with a potential of 42,496 bbl.

IN AN ORDER DENYING an application by Drillers Gas Co. for modification of proration regulations in the Cunningham gas field of Pratt and Kingman counties, the Corporation Commission last week refused to impose price control as a factor in gas allowances. In part, the commission's order stated:

"A considerable portion of the evidence introduced at the hearing deals with matters over which it is questionable whether the commission has jurisdiction. Applicant requested that the commission attempt to regulate the price at which gas produced under its order is sold, the place of delivery to purchasers and individual well connections. It is apparent that each of these factors is of considerable importance to drillers as well as to all other purchasers operating in the field. However, it is doubtful whether the commission should attempt, especially at this time, to claim or disclaim any control with respect to these particular considerations."

ILLINOIS

GOV.-ELECT DWIGHT H. GREEN, who will be inaugurated January 13, has implied he will not ask the state legislature to take steps to prorate Illinois oil production. The new state executive will take over duties of his office 6 days after the incoming legislature convenes. At a press conference he said "some friends" are collecting data on oil production for him and that he is considering the problem, but he refused to comment on the data or any conclusions he may have reached. Mr. Green said he did not plan to recommend action by the legislature on any oil measure in his inaugural message.

"I haven't included anything on it in my plans for the inaugural address," he said. He stated his first speech as governor would merely include general statements rather than specific suggestions. He declined to comment on possibility of creation of an Illinois oil commission. Various Republican leaders have intimated the agency eventually will be created at the legislative session in order to forestall and combat federal control of the Illinois oil industry.

TEXAS

THE RAILROAD COMMISSION on Monday ordered an additional statewide shutdown of oil wells on January 8, bringing the total number of producing holidays to 10 in January, the same as in December. Other shutdown days of this month are: January 1, 4, 5, 11, 12, 18, 19, 25 and 26. In announcing the added day, Commission Chairman E. O. Thompson stated that the commission is determined to keep Texas' production within the Bureau of Mines estimates of market demand for Texas crude.

Colonel Thompson also on Tuesday stated the current statewide order would be continued in February and March unless evidence presented at the statewide hearing January 16 required a change. The other commissioners agreed in this action, he said.

Need for the additional day was made evident by a report of the Oil and Gas Division of the commission which showed that the state's allowable last week declined 19,201 bbl. but still remained 4,012 bbl. over the bureau's recommendation. As of January 4 the commission estimated Texas' net allowable at 1,348,717 bbl. daily, 51,217 bbl. over the bureau's figure of 1,297,500 bbl. Subtraction of a forecast 3.5 per cent underproduction of allowables, however, lowered the overage to only 4,012 bbl.

All proration districts showed slight gains in allowable except the Panhandle, where the daily average dropped 21,972 bbl. from the level of the previous week due to action of the commission in adding that district's fields to the shutdown list. In December the Panhandle area had been exempted from the 10 shutdown days. Allowable of this area therefore was reduced to 63,609 bbl. daily, with only 2,730 bbl. being exempted from shutdowns.

Allowables of the other proration districts as of January 4, in barrels, and the change from the previous week were reported as follows: Southwest Texas, 218,792, up 605 bbl.; Gulf Coast, 239,739, up 451; East Texas, unchanged at 371,752; East Central Texas, 83,941, up 109; West Central Texas, 49,565, up 276; West Texas, 206,943, up 353; and North Texas, 114,375, up 976 bbl.

OLIN CULBERSON, sworn in as a member of the Railroad Commission of Texas last week, in his inaugural address declared he was in favor of maintaining Texas' oil production within the recommended figure set by the Bureau of Mines. He also declared for: Complete hearings on matters before the commission prior to issuance of orders; the fewest possible changes in oil allowable schedules; unalterable opposition to federal control of the oil and gas industry; and elimination of dead wells from proration schedules. Regarding the holding of hearings prior to the issuance of orders, he stated:

"I firmly trust that there shall be adopted by the commission a resolution providing that no order affecting any of the phases of the industries under the supervision of the commission shall ever be entered until 10 days' notice to all parties concerned has been given, and an open public hearing has been held. This, I am sure, will meet with the unanimous approval of my colleagues."

A HEARING ON THE GULF-McELROY field of Crane and Upton counties, West Texas, held to determine whether this field and the Church-Fields and McClintic fields were all one pool and should all be combined, was held by the Railroad Commission on Monday. Gulf Oil Corp. representatives testified they believed there was a northward migration of oil taking place from under their properties in the Gulf McElroy field. The migration is due in part to lower pressure in the edge of the Church-Fields pool to the north, P. P. Gregory, Gulf engineer, said. He thought that due to reservoir conditions if the Church-Fields field had an allowable of 6,000 bbl. daily, the Gulf-McElroy field should have about 20,000 bbl. Efficient flow for the Gulf-McElroy based on 1939 tests would be about 25,000 to 30,000 bbl., Mr. Gregory testified.

A. Willig, engineer for Texas Co., said he believed that whatever method was used for calculating allowable for the Gulf-McElroy field should be used for the Church-Fields field. Texas Co. operates a strip of wells across the southern end of the Church-Fields field, north of the Gulf properties.

MICHIGAN

REVERSING A DECISION of the Midland County Circuit Court, the Michigan Supreme Court Monday upheld validity of Porter Royalty Pool, Inc., releasing a reputed $1,000,000 in royalties to 153 persons. The unanimous decision, signed by Justice Thomas McAllister, was in the suit of Glenn P. Hathaway and others, contending an agreement to pool oil interests in 95 parcels of land in Chippewa Township, Isabella County, was a violation of Michigan blue sky laws. Circuit Judge Ray Hart of Midland permitted the dissolution, although finding no fraud existed. Reversing him, the Supreme Court ordered the contract enforced.

The high court held that the plaintiffs, deciding to abandon plans to pool interests with other leaseholders, could not claim the joint agreement and issuance of stock to collect royalties had status under the Michigan securities law.

The original case began in Circuit Court in February 1934, by Glenn and Mildred Hathaway, subsequently 24 other persons became cross plaintiffs. Decision was unanimous. The hearing began in 1938 in Midland and after the decision the pool appealed the decision.

CONTEMPLATED CHANGES in rules and regulations affecting the Michigan oil industry will be considered at a public hearing called for 10 a.m. January 13 at Lansing by the state Oil Advisory Board and P. J. Hoffmaster, director of wells. Mr. Hoffmaster said the major matter for consideration is the board's recommendation that proration schedules be fixed on a per-well instead of a per-lease basis. The board also will consider issuing rules to regulate transfer of drilling permits, and communitization, by which drillers would be encouraged to pool interests in acreage less than the legal drilling unit in order to avoid waste from excessive number of wells.

LOUISIANA

THE MINERALS DIVISION of the Louisiana Department of Conservation has set the next state-wide hearing for January 13 in the Monteleone Hotel at New Orleans. Conservation Commissioner B. A. Hardey, in the announcement of the hearing, stated that evidence will be heard on the market demand for crude oil and natural gas for the purpose of setting allowables for the 60-day period of February and March. During January the state's allowable was set at 292,756 bbl., or 5,356 bbl. above the recommended figure set by the Bureau of Mines and 5,508 bbl. over the December allowable.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

The Immediate Task

Washington observers agree that the new Congress shortly will be asked to pass the Cole bill or its equivalent providing for federal control of the petroleum industry.

All the pressure that can be applied by a control-minded administration, backed by the pretext of a defense emergency, will be exerted in an effort to break down the opposition which is known to exist at this time among a majority of the nation's legislators.

As to why the administration insists on continuing its efforts to secure control, the only enlightenment comes from the president's letter to Congressman Cole, stating: "The vital need for petroleum in national defense, its importance in commerce and industry and the critical conditions in Europe and Asia, confirm my belief in the urgent need of federal legislation to safeguard our petroleum supply through the prevention of waste and by the establishment and maintenance of sound economic conditions in the oil industry."

No one will deny the importance of the questions raised in this statement but it is not clear what the industry under federal control would do in these matters that it is not now doing.

Every phase of the defense program, including our possible participation later in the conflicts of the Eastern Hemisphere, has been gone into by the Government's investigators and they have found no cause for complaint as regards oil. To use an expression that has become trite in this industry, there are no bottlenecks.

If the defense program tomorrow were as far along as it expects to be 2 to 5 years from now, its petroleum requirements within this country would be supplied adequately in quality and quantity.

Public-spirited leaders of this industry who are deeply interested in every phase of the defense plans, wholly aside from the possible effects on their operations, have made detailed studies of petroleum's position in relation to the military and their recent reports should cause alarmists to seek other fields.

Regarding commerce and industry, this business, from its beginning, has steadily expanded its output and facilities better to serve every customer.

Large numbers of manufacturing plants cannot start their defense contracts because they do not have the required raw materials and machinery. But there are no delays due to a lack of petroleum. Oil-powered transportation can be expanded to meet all requirements on land and water and in the air. Petroleum is one industry which can supply our armed forces without restricting use by civilians and commerce.

The matter of waste prevention as an excuse for federal intervention in oil control never had less weight than it does now. The state conservation bodies have been diligent in matters pertaining to physical waste.

With few exceptions, the operators themselves are now as waste-conscious in the production, refining and transportation of oil as they are of any other forms of incompetence in the operations of their companies. Incidentally, as to this, it is difficult to be unduly concerned at a time when Washington admits that inefficiency and waste of public funds are to be overlooked in accomplishing the defense objectives in the shortest possible time.

Finally, there is the matter of "establishing sound economic conditions." It is true that operators generally are entitled to greater profits than have been theirs over the past 3 years and there are other conditions that need more attention than they have been given. But those directly concerned are content to leave this a responsibility of the industry rather than Government.

Thus, the questions raised by the seekers of federal control were answered before they were asked. The immediate task is to see that legislative Washington clearly understands that fact and acts accordingly.

I.C.C. Proposes Drastic Cuts In Pipe-Line Rates

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 7.—The Interstate Commerce Commission has decided to exercise the authority over pipe-line rates which it has had, unused, since 1906. It has issued an order giving the principal interstate crude-oil pipe lines until February 23, 1941, to show cause why the I.C.C. should not order them to reduce their rates by $30,000,000 so as to keep their earnings to 8 per cent return on their valuation. They are also required to show why the minimum tender of crude oil should be in excess of 10,000 bbl.

The order was issued in docket No. 26570, a case which grew out of a controversy over the N.R.A. petroleum code in 1934. At that time Secretary Ickes, as oil-code administrator, asked the I.C.C. to suspend certain pipe-line tariffs reducing rates, but instead the commission, on its own motion, ordered a general investigation of crude-oil pipe-line rates and gathering charges. Two sets of hearings were held and the examiner made two proposed reports but in neither did he recommend the action now taken by the I.C.C. For this reason the commission refrained from ordering reductions in rates at this time but instead gave the pipe-line companies an opportunity to submit evidence as to individual rates.

Of the 35 crude-oil pipe lines covered by the investigation, the I.C.C. found that 14 of them earned less than 8 per cent return on the official I.C.C. valuation, based on 1935 business. The remaining 21 are called upon to reduce their rates in such a way that their earnings will not exceed 8 per cent. On the basis of 1935 earnings this would reduce returns to individual lines by percentages ranging from 3.75 to 55 per cent, an average reduction of 24.46 per cent, or a total of $30,238,952.

This is said to be the only time the I.C.C. has ever ordered a rate reduction on the basis of a carrier's earnings alone and without reference to competitive conditions or other considerations. In a dissenting opinion, Commissioner Mahaffie declared that this principle may be used in regulating a public utility which has a monopoly but is not practical in a competitive field.

"Rates," wrote Commissioner Mahaffie in his dissenting opinion, "do not necessarily determine the level of earnings. Other factors such as volume of traffic, management and taxes may also be influential. Neither am I convinced that different rates for identical services can long be maintained by competing companies."

Minority Opinion

Exception was taken to the majority conclusion that more or less uniform rates of all lines serving a particular destination territory implied impropriety in the tariff schedules.

"This is certainly to be expected," declared Commissioner Mahaffie, "if the companies also serve common origins and expect to continue in business as common carriers. Four companies, Shell Pipe Line Corp., Sinclair Refining Co. (Sinclair Prairie Pipe Line Co.), Stanolind Pipe Line Co. and Texas-Empire Pipe Line Co., are listed by the report as operating from the Mid-Continent field to Chicago. On October 1, 1938, (the latest date covered by this record), their rates to Chicago were identical. On the basis of the figure shown in the report, the reductions in rates which the majority opinion would require range from 13.4 per cent in the case of Sinclair to 55.01 per cent in the case of Texas-Empire. Instead of 38.5 cents for the movement from Mid-Continent to Chicago these companies on that basis should have charged 33.5, 30.5, 29.5 and 17.5 cents, respectively. Unless the first three companies met the 17.5-cent rate the business of the Texas-Empire undoubtedly would have increased to such an extent as to require a further reduction."

The timing of this decision is significant since it comes when the Department of Justice and certain groups in Congress are seeking to divorce pipe lines from control by major oil companies and when independent marketers are complaining that the majors use profits from pipe-line operation to subsidize marketing operations.

In one of his proposed reports the I.C.C. examiner pointed out that while pipe lines are common carriers under the law they actually are plant facilities of integrated oil companies, and this was stressed by the pipe-line companies when the case was argued. The commission, however, took the position that regardless of the facts, pipe lines are subject to rate regulation by it and in the absence of other basis the commission must construe large earnings as evidence of excessive rates. The commission's comment on this situation is interesting:

What Is Reasonable Rate?

"We are left to determine what is a reasonable rate without the benefit of any showing by an independent shipper as to what the service may be worth to him. It is evident that so far as the pipe-line rates before us may be compared with the charges of the other agencies of transport which are subject to our jurisdiction, voluntarily made by the carriers or prescribed by us, by and large the pipe lines' rates are far the lowest of any offered. The industrial risks urged upon us to justify the relatively high earnings shown, and as necessary to attract capital for the construction of pipe lines, have been fully met in the past, and are now being met in spite of rate reductions. Successful operation of pipe lines, the respondents contend, depends upon large non-carrier investments in leases and drilling costs and in refiners storage and shipping terminals; in other words, the integrated company is pictured as the ideal setup for a crude-oil pipe line.

"We cannot attach any controlling weight to the fact that the respondents or their beneficial owners have seen fit to pay charges from one pocket to the other, or to operate their common carrier and industrial properties in such a manner that the carrier system is virtually a plant facility of the larger producing, manufacturing, and selling industry. These facts, if they be facts, are immaterial in this proceeding.

"Congress requires all rates tendered to the public by these common carriers to be just and reasonable, and no more. Every carrier subject to the (interstate-commerce) act must maintain a schedule of just and reasonable charges, regardless of whether the public generally has been or is in a position immediately to avail itself of the service. The general measure of the rates of many important respondents is excessive, and it is no answer to such a finding that independent shippers are few, or that they are not using the services offered, when the rates demanded are excessive. . . .

"Even after the reductions effected during the proceeding, and in a period of depression, the net earnings of certain respondents stand out as so great as to challenge attention, and to raise a serious question whether rates which yield such returns can be other than unreasonably high. Other respondents meantime have had but small returns.

"Based upon data taken from returns to our questionnaire, supplemented by final valuation reports issued by us under Section 19*a* of the act, which are prima facie evidence of value for the present purposes, the respondents earned, on 1935 traffic, returns upon the value of their properties as of December 31, 1934, ranging from a low of a deficit in return of 0.6 per cent of value to an annual rate of return of 46.86 per cent of value. The average for the 35 respondents was 14.01 per cent return.

"Fourteen respondents earned less than 8 per cent on the value of their property:

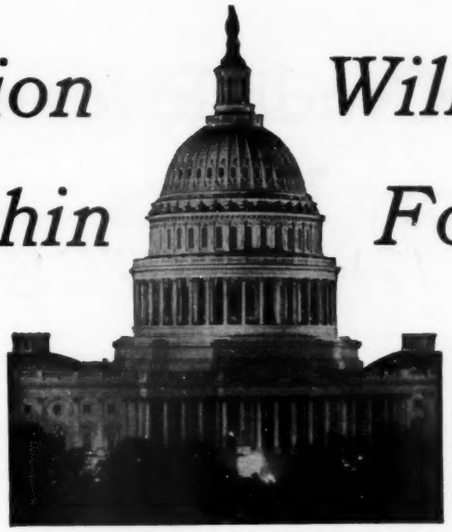
Name of carrier—	Earnings, over expense	Per cent return on value
Montana Pipe Line Co.	$421	.60*
Eureka Pipe Line Co.	18,288	.29
Northern Pipe Line Co.	27,128	1.86
Buckeye Pipe Line Co.	297,551	2.04
Continental Pipe Line Co.	95,226	2.31
South West Pennsylvania Pipe Lines	604,617	3.13
Indiana Pipe Line Co.	439,890	3.26
Standard Pipe Line Co.	590,074	3.45
National Transit Co.	301,482	6.25
Gulf Pipe Line Co.	2,153,613	6.29
New York Transit Co.	38,987	7.21
Empire Pipe Line Co.	352,818	7.41
Tide Water Pipe Line Co., Ltd.	359,663	7.65
Illinois Pipe Line Co.	1,884,387	7.69
Total	$7,163,301	

*Deficit.

"The foregoing 14 respondents contribute approximately one-ninth. The remainder was contributed by the following respondents:

Name of carrier—	Earnings over expense	Per cent return on value	Excess actual earnings over 8 per cent return
Standish P. L. Co.	$635,395	9.72	$112,640
Gulf P. L. Co. of Okla.	731,031	10.74	186,591
Pan American P. L. Co.	405,223	11.02	110,927
Oklahoma P. L. Co.	1,426,961	11.17	405,391
Sinclair Prairie P. L.	5,314,874	11.30	1,553,399
Tuscarora Oil Co., Ltd.	382,775	11.74	121,959
Humble P. L. Co.	7,533,202	12.59	2,745,693
Texas P. L. Co.	5,041,169	13.84	2,127,246
Shell P. L. Co.	6,100,351	16.41	3,126,183
Stanolind P. L. Co.	8,274,405	17.53	4,498,392
Imperial P. L. Co., Ltd.	260,810	18.11	145,610
Atlantic P. L. Co.	2,829,391	19.69	1,654,467
Texas P. L. Co. of Okla.	671,457	20.19	405,384
Sinclair Prairie P. L. Co. of Texas	3,327,410	21.46	2,086,817
Ajax P. L. Co.	2,726,333	23.05	1,780,093
Gulf P. L. Co. of Pa.	2,717,836	23.94	1,709,836
International P. L. Co.	96,770	29.77	70,768
Arkansas P. L. Co.	317,827	31.77	237,805
Tidal P. L. Co.	659,088	32.93	499,008
Texas-Empire P. L. Co.	5,465,085	37.53	4,300,052
Pure Transportation Co.	2,726,000	46.86	2,260,691

Oil Legislation Will Be Before Solons Within Four Months



By HENRY D. RALPH

WASHINGTON, D. C., Jan. 6.—Legislation for federal regulation of the oil industry will be actively before Congress within 4 months.

At the opening session of the Seventy-seventh Congress on January 3, the House adopted a resolution extending until May 1, 1941, the time for its committee on interstate and foreign commerce to make a report on its investigation of the petroleum industry and the Cole bill to regulate conservation practices. This action was taken at the request of Rep. William P. Cole, Jr., of Maryland, chairman of the petroleum subcommittee, who filed an interim report on the last day of the old Congress.

Additional hearings will be held by this subcommittee in the near future, giving particular attention to national-defense considerations as requested by President Roosevelt in a letter to Mr. Cole last month. Had it not been for this letter, the subcommittee would have filed a preliminary report on the hearings it conducted last year, but in view of the president's request for speed it simply asked for authority to conclude its work and make a final report within the next 4 months.

Dates for additional hearings have not yet been set, and Representative Cole himself is absent from the Capitol because of illness. For this reason he has not yet reintroduced his conservation bill, which was drafted in the Interior Department, and which bore the number H.R. 7372 in the last Congress. While this bill is now officially dead, there is no doubt that it or a revised form of it will be referred to the subcommittee, although the group has authority to recommend broad legislation relating to the oil industry regardless of whatever specific bills may be before it.

Subcommittee Will Continue

The petroleum subcommittee will continue to operate under the terms of the resolution adopted by the House in August 1939, shortly after the Cole bill was introduced, directing it to bring up to date the report of the first Cole investigation submitted on January 3, 1935. This resolution not only directs a recommendation on the "practicability and advisability of enacting legislation of the character of H.R. 7372," but also asks the committee to report on a wide range of conditions in the oil industry, such as: whether there is an excessive supply of petroleum products on the market, and if so whether this results in waste; whether restrictions should be placed on oil production whether or not in interstate commerce; the effect of present conservation methods on the industry and on future reserves; and whether present practices in the production, transportation, and distribution of petroleum products constitute unfair methods from the standpoint of producers and consumers.

It was through the authority of this resolution that Representative Cole last fall obtained for his committee jurisdiction over legislation then before the judiciary committee to divorce marketing and transportation from other branches of the oil industry. No divorcement bills were introduced on the opening day of the session, but they will undoubtedly make their appearance before long and at any rate the Cole committee has authority to recommend marketing reforms.

The prospect is, therefore, that a revised form of the Cole bill will be presented to the House before the first of May, and that it will be broader than federal standards of conservation as provided in last year's H.R. 7372 and may attempt to impose federal regulation on the oil industry all the way from drilling to the filling station. By that date, also, the Temporary National Economic Committee should have made its final reports, which are expected to include recommendations for some sort of federal control of the oil industry. With President Roosevelt and Secretary Ickes so obviously pressing for early action, the industry can anticipate a showdown in Congress this spring.

●

Fuel-Oil Price Increase Not Result of Defense Program

RECENT rises in the price of domestic fuel oil are not the result of the defense program and there is no justification for a further rise, according to a preliminary investigation released recently by Miss Harriet Elliott, commissioner in charge of the Consumers Division of the National Defense Advisory Commission.

Primary cause of the price rise is increased demand for fuel oil for home, office and apartment heating, providing an opportunity to producers and distributors to secure higher prices.

Shortage of tankers to transport the oil from the Gulf to New England ports does not explain the price rise. Tanker and storage facilities are adequate to take care of existing demands. Operating costs of tankers have not risen. Insurance rates have not risen and have been lowered in some instances. Although the rates have increased slightly, they constitute no more than 15 per cent of the total costs of tanker operations.

Tanker tonnage transferred to the Navy and to foreign registry represents only about 13 per cent of the total tanker capacity.

Tankers Under Construction

Published charter rates for tankers have increased, but 90 per cent of the oil moving from Gulf ports to the Atlantic seaboard is transported in tankers belonging to large oil companies which do not pay the published charter rates. Apparently there has been no important increase in the costs of operating these tankers.

Should the situation in tanker facilities eventually become critical there are sources from which added facilities may be made available. Fifty-six new tankers representing a capacity of over 500,000 tons are now under construction and some of them are near completion.

The price rise along the Atlantic seaboard follow: The retail price per 100 gal. of No. 2 fuel oil increased in Boston this year from $6.13 on September 15 to $7 on December 15; in New York from $6.12 to $6.89; in Philadelphia from $6.33 to $6.75; and in Baltimore from $6 to $6.75. The September 15, 1939, December 15, 1939, and March 15, 1940, retail prices were: In Boston, $6.18, $6.75 and $7.05; in New York, $6.38, $6.69, and $7.14; in Philadelphia, $6, $6.40 and $6.98; and in Baltimore, $6.25, $6.83 and $7. Tanker rates from the Gulf to North Atlantic ports rose from 21 cents a barrel in August to 80 cents in December, as compared with a rise from 16 cents to 60 cents during these same months in 1939. Gulf prices for No. 2 oil fell from $4 per hundred gallons in December 1939 to $3.25 in September 1940. There have been no further decreases since then.

●

Sumner Bill on Mexican Oil Is Again Introduced

THE flood of new legislation at the opening of the Seventy-seventh Congress saw the reintroduction of the Sumner bill aimed at the exclusion of Mexican oil. The measure, H.R. 144, orders the president to refuse entry to property confiscated by any foreign country, and gives him discretionary power to keep out oil sent through pipe lines which also carry expropriated oil.

Legislation designed to stop the rising imports of Mexican oil was rebuffed by the last Congress. The McCormack bill, making it mandatory to exclude confiscated property, was pushed through the Senate under a cloak of silence. At hearings held by the House, the Sinclair company accused the Standard interests of fathering the measure to embarrass its settlement with the Mexican Government. The bill remained bottled up in committee when the State Department objected to the international controversies which might arise by its passage.

Same Fate Predicted

The Texas bloc in the House then put forward the Sumner bill, which left it to the president's discretion whether to keep out the oil. Brought up for a vote under a special rule, the bill was turned down when congressmen criticized its all-inclusive nature and broad phraseology.

Since the new bill is practically identical to the old, there is no reason to believe that it will meet a happier fate, unless more pressure is brought to bear.

The first alky-gas bill tossed into the hopper was H.R. 35, introduced by Rep. R. G. Tenerowicz of Michigan, to prohibit the interstate transportation of motor fuel unless it contains alcohol of domestic agricultural origin in a blend starting at 2 per cent in 1941 and increasing to 10 per cent by 1945.

The bill to give the Public Health Service jurisdiction over pollution of navigable streams, which caused a congressional deadlock for more than 2 years, appears again as H.R. 1110, by Rep. Brent Spence of Kentucky.

Stiffening of Crude Prices Noted on Many Fronts

THE general advance of 10 cents in Michigan prices, increase of 6 cents in two Louisiana fields, and a 2 per cent increment in New Mexico, all developing since the turn of the year, gave added evidence of vigor in the crude-oil market outside Texas.

The Michigan advance which applied January 2 to all fields excepting those in the western part of the state boosted crude prices there to the highest figure in 3 years. Leadership in the Michigan advance was taken by Simrall Corp. and Pure Transportation Co. An initial posting of $1.48 per barrel for high-gravity distillate produced by Gulf Refining Co.'s new deep discovery was made by Bay Pipe Line Co., which has contracted to purchase the oil. Gulf's discovery in Monitor Township, Bay County, is producing approximately 80 bbl. daily. The price of $1.48 is the highest paid for any Michigan production.

Placid Oil Co. (H. L. Hunt) increased the posted price for Urania-Tullos crude in La Salle Parish, Louisiana, 6 cents per barrel January 3 and the advance was met promptly by Arkansas Fuel Oil Co., operating subsidiary of Cities Service.

The New Mexico increase of 2 per cent resulted from a change in policy rather than from an advance in the posted prices. Effective January 1 the crude purchasers in New Mexico started paying on 100 per cent of tank tables. Settlement for previous crude runs had been on a 98 per cent basis. Since the previous posted prices remain in effect the policy change amounts to an increase in the producers' revenue.

Another advance was of 5 cents per barrel posted January 1 by Sohio Corp. for crude purchased in the Birk City field of western Kentucky. The advanced price there is now 95 cents.

The only revision of consequence in Texas was a downward adjustment posted January 1 by Continental Oil Co. in several Nueces and Jim Wells County fields. Continental met the lower prices posted several weeks ago by Republic Oil Refining Co. The net change is a reduction of 20 cents per barrel on the higher-gravity crudes in several fields.

Pan American Pipe Line Co., which recently completed facilities for delivering East Texas crude to its affiliated refinery at Texas City, entered four fields as a purchaser. The company posted the prevailing price of $1.10 per barrel in East Texas, 78 cents in Cayuga and a gravity scale ranging from 88 cents to $1.28 in the Hastings and South Houston areas.

Continental announced new prices in the following fields: Clara Driscoll, South Clara Driscoll, Driscoll Ranch, and Minnie Bock. The new schedule ranges from 93 cents a barrel for crude of 20° to 20.9° gravity with a 1-cent increment for each degree of gravity making 40 and above to $1.13. The previous price started at the base level of 93 cents but extended upward at 2-cent intervals to $1.33. The company also established flat price of $1.08 for crude in the Alfred and Magnolia pools of Jim Wells County, a reduction of 20 cents.

The Michigan advance followed an almost steady decline in the production curve throughout 1940. The state's output declined from a peak of 68,145 bbl. daily the first week of 1940 to a rate of 42,145 bbl. at the end of the year. In the last half of 1940 the decline in Michigan was accompanied by a reduction in Illinois which started off the new year at approximately the rate obtaining a year ago. The decline of 26,000 bbl. in the daily average output of Michigan was cushioned during the early part of 1940 by a steady increase in Illinois. Simultaneous declines in both states during the past few months brought new pressure to bear on the supply situation finally culminating last week in the Michigan price advance as purchasers moved to solidify their connections.

Indirect premiums for Illinois crude are being offered on a widening scale.

Oil Industry and Federal Control Subject of Magazine Article

That the current war has focused public attention on oil, and on the administration's attempt to seize control of this vital industry, is borne out by the fact that a large mass-circulation general magazine last week published an article reviewing the administration's efforts to secure passage of the Cole bill. Ruth Sheldon, several of whose contributions have appeared in The Oil and Gas Journal, has an article in the Saturday Evening Post of January 4, entitled, "Oil War Over Here."

Miss Sheldon's review relates the entire history of the federal Government's efforts to obtain control of oil, beginning with what she calls the "Orson Welles technique" the Department of the Interior employed in 1939 to portray an alarming picture of an oilless America. This was the series of radio broadcasts which was the buildup for the Cole bill, which was introduced in Congress less than a week after the last broadcast. She then tells how the industry, thoroughly alarmed, combated the Government's efforts, and sought to discredit Mr. Ickes by charging him with a desire to become oil dictator. Mr. Ickes' answers to the charges are quoted, in all their picturesqueness and vituperation.

With the spreading of the war, the Government had a new weapon, that of appealing to patriotism, which it promptly and aggressively employed. But the industry had an answer to that argument, too, as Miss Sheldon relates, and on several occasions has proclaimed its capacity for any emergency that may confront it, its able and skilful management, and its own patriotism.

In one of her concluding paragraphs she says that "the oil industry sees itself facing the possibility of the old pincer play—if it practices conservation on its own it violates the antitrust laws; if it doesn't practice it the Government has the grounds to demand federal control."

DEATHS

FARRAN M. MORGAN, 63, president of the Clevetex Producing Co., died in Dallas, Tex., January 4, after a short illness. He had been a resident of Dallas for 10 years. A pioneer in the East Texas oil fields, he also was instrumental in opening the Rotan field in West Texas. He had other oil interests in Arizona, Illinois, Washington and California.

FRANK B. FRIGGLE, 77, for the past 20 years an employe of the Pennzoil Co., Oil City, Pa., died January 1, after being stricken the same day with a chest pain. He had been an engineer at Pennzoil. He leaves his wife and five daughters.

NORTON LOWREY UPSON, 93, one of the country's pioneer oil producers, and of whom it is said that he once refused to join in business with the late John D. Rockefeller, died December 29 in Buffalo, N. Y. A heart ailment was the cause of his death. Mr. Upson formerly headed the Commercial Oil Co. of Parkersburg, W. Va., the Pease Oil Co., Buffalo, N. Y., and the Upson Oil & Soap Co., Parkersburg, W. Va. It was during the seventies that Mr. Upson was given the opportunity to join Rockefeller's interests.

LOWRY I. MILDREN, 72, died December 31 in a Tulsa hospital of a heart attack. Mr. Mildren was known throughout the industry as the inventor of a tubing support and casing spider which bears his name. He was born in Pittsburgh, Pa., and came to Tulsa in 1903. He was first an employe of the Devonian Oil Co., and later became superintendent of production for Marland Oil Co., which position he resigned in 1928. He leaves his widow and two sons.

DANIEL O. MORAN, 96, believed to be the oldest oil producer in the world, died at his home in Oil City, Pa., January 1. He had been in ailing health for the past year. Born in Titusville, Pa., in 1844, he entered the oil business in 1862. His first well is still producing oil. He leaves six daughters and a son.

JOHN H. LYNCH, 43, of the Pennzoil Co., Oil City, Pa., died suddenly at his home, December 28. Death was caused by a heart attack. His wife and a son survive.

HENRY J. HOLM, 79, a former independent oil man, and a pioneer resident of Bartlesville, Okla., died January 4 at his home in that city. He was born in Wisconsin. In 1905, a year after moving to Bartlesville he and several associates, including Frank and L. E. Phillips, organized the Citizens Bank & Trust Co. This later became the First National Bank of Bartlesville, and Mr. Holm was vice president of the bank until the time of his death. His widow, a daughter and two sons survive.

CHARLES EMERY WHITE, 72-year-old employe of the Indian Territory Illuminating Oil Co., Oklahoma City, Okla., died December 31 of a heart ailment after a 9-day illness. Mr. White was born in Indiana, and made the run in Oklahoma, settling in Guthrie. Later he moved to Nowata, and finally to Oklahoma City. Three sons and four daughters survive.

CURTIS MADISON BOONE, 41, telegraph operator for Atlas Pipe Line Co., at Blocker's Station, near Marshall, Tex., died December 30 when his automobile plunged into Red River at Shreveport, La. The cause of the accident is not known. His widow survives.

FRED A. MINDERMAN, 56, an employe of the Magnolia Petroleum Co. since 1924, died at Electra, Tex., December 31, of a heart attack. He had been a resident of Electra for 45 years. His widow, a son and a daughter survive.

IRVING E. ROFFEE, 58, an oil dispatcher for the Buckeye Pipe Line Co. for 19 years, died in a Lima, Ohio, hospital, December 28, after a short illness. He leaves his wife and two sons.

MERL E. BEALS, 54, a former drilling contractor of Bradford, Pa., died December 29, in a hospital in Canandaigua, N. Y. He had been a patient in the hospital for 2 years, and his condition had been serious for the past 2 months. His wife, a son and a daughter, all of Bradford, survive.

BERT L. LIGON, 44, independent oil operator of Wichita Falls, Tex., died January 6 in a Wichita Falls hospital after a brief illness. Born in Kerrville, Tex., Mr. Ligon came to Wichita Falls in 1913 where he was employed as a well shooter until the World War. After the war he served as a salesman for various supply firms in North Texas and in 1932 joined Wilson Manufacturing Co., Inc., at Wichita Falls, became sales manager and later a partner in the concern. When the K.M.A. boom got under way he resigned as sales manager to develop his properties in that field, and at the time of his death had a large number of producing properties in that field and in other North Texas fields. Survivors include the widow, two children and three brothers.

PENBERTHY PRODUCTS

Reflex

DROP FORGED STEEL LIQUID LEVEL GAGE

EMPTY SPACE SHOWS **WHITE** | LIQUID SHOWS **BLACK**

* * *

Transparent

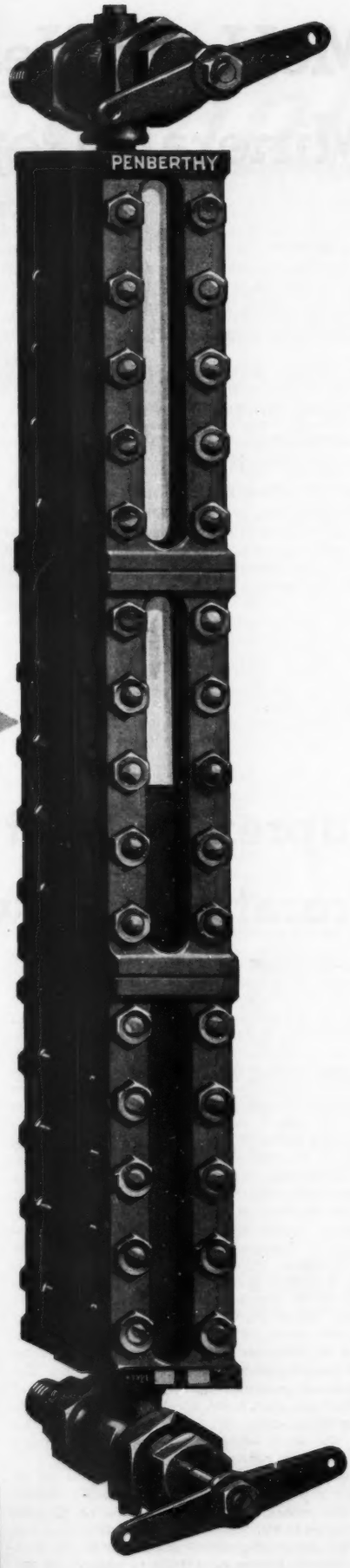
DROP FORGED STEEL LIQUID LEVEL GAGE

USED TO OBSERVE COLOR AND DENSITY OF LIQUIDS UNDER HIGH PRESSURES, AND/OR TEMPERATURES

These gages are made of alloy temperature resisting steel and are of the highest quality throughout. Liquid chamber (both single and multiple section) is made from a solid block of steel to assure perfect alignment and rigidity. Frame has extra heavy beam at each end and glass chamber is accurately machined to contour of glass providing full metal backing for gaskets. Gage valves are drop forged steel with stainless trim.

These gages are available in any length and for various pressures and temperatures. All Penberthy gages conform with A. P. I.—A. S. M. E. requirements.

PENBERTHY INJECTOR CO.
DETROIT, MICHIGAN
Canadian Plant: WINDSOR, ONTARIO



McHugh Heads Louisiana Minerals Department

By GEORGE WEBER

SHREVEPORT, La., Jan. 6.—Joseph L. McHugh, Crowley, La., has been appointed by Gov. Sam H. Jones to head the new Department of Minerals of the State of Louisiana. He will become director of the department upon reorganization of the state's administrative bodies expected to be effective February 1, 1941.

Mr. McHugh has a number of years' experience in the oil industry as an independent operator in North and South Louisiana. He is at present secretary of the state Civil Service Commission, and operates an automobile agency in Jennings. He was formerly state department commander of the American Legion.

New Board Members

A three-man Board of Minerals is also provided under the new reorganization amendment, passed by the last legislature and ratified by the people in November. B. A. Hardey, present conservation commissioner, will resign his position to accept a post on the board. Serving with Mr. Hardey will be C. C. Sheppard, president of the Louisiana Central Lumber Co., Clarks, who has been a member of the state Minerals Board for the past few years. The third member of the board will be Robert Knox, oil and gas attorney of Lake Charles, who has a wide experience in the legal phase of the oil industry.

The new board will combine the experience of a practical oil operator, a member well familiar with department administration and leasing of state lands, and an attorney with a thorough background in oil and gas law. Positions of attorney, engineer, state geologist, chief of land and leasing, etc., have not definitely been assigned, but it is expected that George Wilson will remain in the attorney's position.

Separate Minerals Department

In the interests of better efficiency and economy, the Louisiana Department of Conservation is being split, and all functions dealing with minerals are placed under the new department. Forestry, fur and wild life, fisheries and other related divisions will remain in the Conservation Department. The governor's decree making the changes, effective about February 1, will culminate the reforms in mineral control in Louisiana, effected under the leadership of Governor Jones, Conservation Commissioner Hardey and others following defeat of the Long administration last year.

Act. No. 47 of the Louisiana Legislature, which was amended by voters in the November election, provides for reorganization of the executive department for the purposes of better service and economy. Under this amendment, reorganization of the conservation department provides for separation of the minerals division from that department and the setting up of a Department of Minerals as follows:

"Section 1. Functions of the department: The functions of the Department of Minerals shall comprise all administrative functions of the state now or hereafter authorized by law to be exercised, except as otherwise expressly provided by this act, in relation to development and conservation of the mineral resources of the state and regulation of commercial production therefrom.

"Sec. 2. Transfer of Functions: All such functions as are described in the next preceding section, heretofore vested in, or exercised by, any existing agency, are hereby transferred to, and vested in, the Department of Minerals. Specifically, the functions so transferred and vested, except as otherwise expressly provided by this act, shall include by way of extension and not of limitation, such functions of: The Department of Conservation, the state geologist, and the commissioner of conservation, as to mines and minerals, but not including the functions of conducting surveys of surface waters with primary reference to stream pollution, which shall remain in the Department of Conservation.

"The state Mineral Board.

"The Department of Mining and Minerals, and the superintendent and deputy superintendent thereof.

"All other agencies to the extent that the functions are in the nature of those hereby transferred to and vested in, the Department of Minerals.

"Sec. 3. Organization of the Department: The Department of Minerals shall consist of the director of minerals and the Board of Minerals, which position and board are hereby created, and such divisions as may be established in accordance with this act.

"Neither the director of minerals nor any member of the Board of Minerals shall have any financial interest in any business involving production or dealings in oil or gas or other minerals coming under the jurisdiction of the department.

"Sec. 4. Head of the Department: The director of minerals shall be the head of the department. He shall be appointed in accordance with this act.

"Sec. 5. Board of Minerals: The Board of Minerals shall consist of three members appointed as provided by this act, which shall have such functions with respect to the department as are prescribed by this act for boards of departments. It shall also have authority to fix the procedure for advertising and negotiating mineral leases and the terms and conditions of such leases to be made, and shall approve all such leases before they may become effective.

"Sec. 6. Divisions of the Department: The director shall exercise the functions of the department, other than those of the Board of Minerals, through such divisions as are established under the provisions of this act."

●

Supreme Court Upholds Texas Proration in Two Decisions

WASHINGTON, D. C., Jan. 6.—The Supreme Court today again upheld Texas proration in two related decisions. In a decision fundamentally the same as the one handed down June 3, 1940, in the Rowan & Nichols Todd B case, the court held that the limits on oil production set by the Texas Commission are valid, and affirmed the power and capability of the Texas Railroad Commission to issue proration orders.

In today's decision against the Rowan & Nichols Oil Co. (in its Todd-A lease), the high court vacated the enjoinment decree of the lower court and remanded the case to the District Court for dismissal of the complaint. The court declared that the same decision stands also for the Humble Oil & Refining Co. case, although the facts in both cases are slightly different. Chief Justice Hughes and Justices McReynolds and Roberts disagreed in both cases, holding to the same dissenting opinion delivered in the previous Rowan & Nichols decision.

In 1938 the Texas Railroad Commission issued a proration order allocating production in the East Texas field, when the lower courts enjoined the commission, a new order was issued in 1939. Again the federal court restrained the commission, and the case was appealed to the Supreme Court. In its decision of June 1940, the high court upheld the validity of the first proration order, and in the present decision repeated the same contentions for the commission's second East Texas order.

Rowan & Nichols claimed to be the victims of illegalities in the method of distributing total allowable production among the different classes of oil producers, as set in both proration orders. The commission order first attacked prorated production in the East Texas field to 522,000 bbl. (Held to around 390,000 bbl. daily by shutdowns). The second order allowed a total production of 691,000 bbl., with a minimum allowance of 20 bbl., with a portion of the allowable being distributed on an acreage basis but mostly being a flat per-well method.

Special attack was centered on a provision of the orders permitting wells with an output of 20 bbl. per day or less to produce the maximum, while restricting the production of wells with a larger potential to about the same level. This was declared to be unfair to the better leases and permitted their oil to be drained by offsetting leases.

The court held the commission's order was justified on the grounds that "the minimum allowance accelerates the rate of production of the densely drilled areas on the edges of the field most subject to losses from the migration of oil, that such an allowance is an appropriate incentive to the drilling of small tracts, and that thereby investment losses in low-producing wells are minimized."

In decisive language the court upheld the power of the Texas Railroad Commission to prorate oil production, and as to its own powers ,the court declared, "A state's interest in the conservation and exploitation of a primary natural resource is not to be achieved through assumption by the federal courts of powers plainly beyond their special competence."

The majority opinion also stated that "the Constitution does not provide that the federal courts shall strike a balance between ascertainable facts and dubious influences underlying such a complicated and illusive situation as is presented by the Texas oil fields in order to substitute the court's wisdom for that of the legislative body. The real answer to any claims of inequality or to any need of adjustment to shifting circumstances is the continuing supervisory power of the expert commission."

Move to Regulate Recycling Operations in Texas

HOUSTON, Tex., Jan. 7.—The drive launched by the Gulf Coast Refiners Association for enactment of laws to regulate recycling operations in Texas was outlined this week in resolutions mailed to all members of the legislature.

The association ties its program to the declaration that production of petroleum and derivatives by recycling plants constitutes, in effect, crude oil produced under no restriction and used in direct competition with crude subject to proration.

The association has taken the stand that "the entire scheme of proration of crude is threatened by uncontrolled production by recycling plants."

The Texas Legislature has been asked by resolutions of the association to enact laws that "will place the production of recycling plants upon a ratable basis comparable to that for regulation of the production of crude now subject to proration laws."

"There can be no good reason," declared the association, "for making any distinction between the production of petroleum distillates or derivatives of petroleum and gas in liquid form when there exists only a difference as to mechanics of getting the liquid out of the ground and this same liquid is in direct competition with prorated crude petroleum and its derivatives."

International

Argentina . .

Two Major Expansion Steps Presaged in Y.P.F. Operations

AN expanded program of operations for Yacimientos Petroliferos Fiscales, the Argentine Government petroleum agency, is presaged in reports on two significant plans for 1941.

The project, which appears to be receiving major attention from the Argentine oil agency, is the 1,000-mile pipe line from the Tupungato, Lunlunta and Barrancas fields in the Province of Mendoza, in the extreme western part of the country. The pipe line would terminate on the River Parana at San Lorenzo. Reports circulated in New York are that the government purchasing department is making inquiry among American manufacturers for the necessary pipe.

Argentina recently closed an agreement with the United States for credits, and it is said part of the funds so received will be used for the purchase of material for the line. The plan of the Argentine Government is said to call for construction in 1941.

The other Y.P.F. project indicating a major operating step is the procurement of license for operation of the neohexane porcess developed by Phillips Petroleum Co. The process produces aviation-gasoline blending materials with which it is possible to produce motor fuel with 115-octane rating.

Frank Phillips, chairman of the Phillips company board, announced issuance of the license to the Argentine Government representatives but reports did not detail when or to what extent the privileges would be exercised. The plans for defense of the Western Hemisphere in which the Argentine Government is participating would indicate, however, that facilities for producing aviation gasoline in South America would be constructed as soon as practical.

Australia . .

Caltex Granted Exploratory Concession on 234,000 Sq. Miles

A CONCESSION of 234,000 sq. miles in northwestern Australia, bordering Broome and Derby, is reported to have been granted by the Australian Government to Caltex (Australia) Oil Development Pty., Ltd., a subsidiary of the Texas Co. and Standard Oil Co. of California.

Bolivia . .

Effort Renewed to Finance Pipe Line to Argentina

BOLIVIA has recently turned to the United States in its search for capital with which to build an 800-mile pipe line from fields in the eastern part of the country to the headwaters of a navigable stream in Argentina.

Negotiations between the Bolivian Government and Germany had proceeded to a secondary stage when discussions were interrupted by the European war. The deal discussed with German interests was based on use of Bolivia's metal resources in exchange for Reich pipe.

Bolivia seized oil properties developed in the eastern part of the country by Standard Oil Co. of Bolivia. The Government alleged breach of contract. The dispute is still pending in Bolivian courts.

The Bolivian Government is now reported to be courting private capital on the subject of aiding the Government in the construction of the line. A connection in Argentina with water-transportation facilities would form the final leg in the projected plan for sending Bolivian crude oil into world markets.

Since Argentina produces only about 60 per cent of its internal petroleum consumption the Bolivian oil could compete on a favorable basis with supplies now drawn from Colombia, Peru, and Venezuela, providing a pipe line is built. The formation of a semipublic corporation is being proposed for the construction of the Bolivian line with an initial capitalization of $5,000,000 to $10,000,000. The board of directors is to consist of five of which three would be appointed by the private capitalists and two by the state. All technical matters relating to the production and transportation would be under private direction.

MEXICAN OIL HEAD . . .

E. BUENROSTRO

Petroleos Mexicanos, the Mexican Government petroleum agency operating the nationalized industry, is now headed by E. Buenrostro, who succeeded Vicente Cortes Herrera. The new director of the Mexican petroleum industry has been in public service nearly 20 years. He was consul of Mexico in the United States from 1921 to 1930, when he became general secretary of ex-Pres. Lazaro Cardenas, who at that time was governor of the State of Michoacan. Mr. Buenrostro became under treasurer of Mexico in 1934 and in December of that year was appointed under secretary of the secretary of finance and public credit. He acted as president of the committee investigating ability of the oil companies to pay higher wages and benefits. He participated in the award which was declined by the companies and led to expropriation. He served as secretary of national economy from January 1938 until November 30, 1940, when he was made managing director of Petroleos Mexicanos.

Latin America . .

Import Quotas Reduced As Excise Tax Lowered

A SLIGHT reduction in Venezuela's quota of petroleum and fuel oil to be imported during 1941 under a reduced excise tax was revealed by the Department of State announcement of the annual allocation. Colombia was also given a somewhat smaller quota, and therefore imports allowed the Netherlands West Indies and other foreign countries show a slight rise.

The following quotas, allocated on the basis of imports during 1939, were established for the coming year: Venezuela, 70.4 per cent; Netherlands West Indies, 21.3; Colombia, 3.2; other foreign countries, 5.1 per cent. During 1940 Venezuela received a quota of 71.9 per cent; Netherlands, 20.3; Colombia, 4.0; and other countries, 3.8 per cent.

The quotas, established by the 1939 reciprocal trade agreement with Venezuela, provide for a reduction in the petroleum excise tax from 0.5 to 0.25 cent per gallon of 5 per cent of the domestic crude refined in the United States during the previous calendar year. All imports over the quotas must pay the regular 0.5-cent tax.

Since Mexico comes under the category of "other foreign countries," it may be expected that it will register a large increase in exports to the United States, mainly due to the expropriation settlement by the Sinclair interests.

Mexico . .

Japanese-Controlled Company Receives Another Reversal

CONTRACT of the Japanese controlled Vera Cruzana Oil Co. for exploration of 250,000 acres of prospective oil land in Mexico has been finally canceled, according to reports issuing from Mexico.

The company obtained government consent to continue with exploration providing it posted a "good faith" bond of $600,000 before December 28. An injunction obtained by the company to prevent cancellation of the contract is scheduled for hearing in June.

Loud protest developed from the United States when the Japanese firm was first reported successful in negotiating the contract, primarily because American and British companies had been virtually expelled from the country by the expropriation act in 1938.

Some oil observers attach significance to reports that Josephus Daniels will retire as Ambassador to Mexico. Speculation revolves chiefly around the possibility of settling the expropriation dispute. Ambassador Daniels opposed any display of vigor from the Department of State in dealing with the expropriation issue.

Northern Hemisphere Offers Greater Oil Possibilities

(Continued from Page 15)

larger area to the continents. This is known as the Hercynian or Appalachian Revolution.

Bordering the shelf areas which project outward from the shields there is usually a trough in which large quantities of sediments are deposited. As the shaft area oscillates above and below sea level, it is eroded and material is dumped into this trough and then on submergence, the shelf receives sedimentary material which is again eroded on the next uplift. Briefly, this is the history of most of the United States during the Paleozoic. Omitting any mention of the Caledonian (Silurian-Devonian) Revolution, as it is unimportant from an oil standpoint except where it is involved with the later Appalachian Revolution, the sediments contained in the trough were squeezed by lateral movements extending from the Mississippian through the Permian and folded into mountain ranges which were comparable to the present-day Alps and Himalayas.

As the mountains rose above the sea, the direction of sedimentation was reversed and a series of sands and shales, with some limestone, were deposited as a result of erosion of the newly formed uplift. These series were themselves warped into gentle structures and contain a great series of wedge edges and stratigraphic traps. Moreover, as they were marine in character, they contain source materials for oil. This material, deposited near rising uplifts, thus provided series of multiple oil plays which have proved of great importance in American production. The Devonian and Mississippian of Pennsylvania and West Virginia, the Pennsylvanian and Chester sands of Illinois, the lower Pennsylvanian of eastern Kansas and Oklahoma provide examples of these multiple pay "flysch" areas.

Extent of the Appalachian Folding

The Appalachian-Hercynian chains, like most mountain ranges, splayed out into a number of diverging chains at their western end. Remnants are known in the Sangre de Cristo Range in Colorado and in the Solitario district of Texas, thence they extended eastward as the (buried) Amarillo Mountains, the Wichitas, Arbuckles, Ouachitas and the Appalachians whose eastern extensions plunge beneath the Atlantic in Nova Scotia. In Europe, they form a belt whose width extends from southern Ireland to southern Spain, and stretches across Germany in the north and the Balkans in the south, through the Caucasus district and on into Mongolia where they form the Thian Shan and the chains of southern Siberia. Although much of the area was involved in either earlier or later folding as well and the relationships are not clear, it appears that the Permo-Carboniferous ranges extend to the Pacific (Fig. 2).

In four distinct localities they were separated from the central shields by distances of 1,000 miles or more and in these districts there were many local uplifts. In North America these local uplifts are exemplified by the Black Hills, the Ozarks, the Cincinnati arch, and La Salle anticline and others and each of these uplifts had their flysch zones in which oil fields might develop. The second area lay to the southwest of Fenno-Scandia and is now submerged beneath the double cover of the North Atlantic Ocean and the Tertiary basalt flows. The third area is the Russian platform which embraces almost all of Russia in Europe, part of North Germany, old Rumania, southern Sweden and the Arctic islands off the north coast of Europe. A part of this region received flysch sediments from the Hercynian Mountains and eastern Russia got an additional covering from the Urals which were formed later.

The fourth area containing Paleozoic flysch deposits is in western Siberia and, like Wyoming, this area received later sediments as a result of the invasion of an arm of the sea from the north during late Mesozoic and early Tertiary time. Although prospecting of the submerged area beneath the North Atlantic is necessarily indefinitely delayed, Russia contains two areas which are potentially like the Mid-Continent region of America although they have received little attention up to the present time.

This is undoubtedly due to the fact that the Soviet Union, desperately in need of oil for its increasing industrial needs, turned to areas which were already proven where structures were more easily found and where flush production is greater than in the more gently folded Paleozoic platforms.

●

Ten Pay Levels Now Producing At Texas' Hull-Silk Field

(Continued from Page 13)

ing sufficient water for drilling, Hull-Silk has a separate water-distributing company. It operates from an old irrigation ditch about 2 miles north of the field. The only water encountered in drilling is found at about 60 ft. and at 400 ft., however, during the dry seasons of the year it is inadequate for drilling purposes. During the early developmental stages of the field the water company was founded and lines were then laid to various parts of the field. Operators purchase their water at a stipulated sum, dependent upon the depth of the well to be drilled.

By universally followed practices throughout the field drilling time has been cut about half since the field's discovery. The 4,300-ft. wells are completed in about 15 days and the 3,800-ft. wells in about 12 days. The shallower wells from 900 to 1,627 ft. are drilled with portable rotaries in about 2½ days. About 3 to 4 days are required for spudding the shallow 464-ft. wells.

In the early developmental stages of the field almost all wells were drilled into the pay zone with spudders, however, now many operators are using rotaries and drilling in with oil. Some wells are drilled into the pay with regular drilling fluid, however, this practice does not afford best completions. Most of the deep tests are completed as flowing wells but some of the early completions have since gone to pumping. All of the shallow-zone wells are equipped with pumping units, either individual with electric motors or from a central power.

Oil from the various pay zones in the field is very uniform in quality. From the shallowest to the deepest pay level, the gravity range falls between 39° and 42°.

Development Still in Early Stages

The deep zones of the field are by no means defined and extension activity is being carried on steadily. There are at present some 12,000 acres of area proven for production. The majority of the shallow producing spots embrace little more than a few hundred acres, however, either the 3,800 or the 4,300-ft. pay is found throughout the entire field.

As the deep production is extended new shallow pays are continuously found which are subsequently developed. The Hull-Silk field was discovered below several old and semidepleted shallow fields. In some instances these old fields are being extended or revived by new completion methods.

Following somewhat the scheme at the K.M.A. field in Wichita County, pressure-maintenance projects for the field are already being considered, but although the majority of the operators are desirous of starting some kind of a project, the course is still undecided. Continental Oil Co. has taken the lead in organizing the producers toward the goal of establishing a gas-recycling project for the field. Early the past fall the plans were first announced but still the satisfactory cooperation of some producers has not been obtained.

Bottom-hole pressure in the field is about 1,500 lb. at the 4,300-ft. producing level which would be the one receiving the gas input. There is little or no gas cap above any of the pay levels. Definite plans for the project are expected to be formulated in the near future as the majority of the operators would like to have the project in operation as soon as possible.

On the whole, the Hull-Silk field is one of the leading fields of North Texas and will probably continue to expand during the coming months.

●

Plans for Oil Dinner Nearing Completion

Plans are rapidly maturing for the annual membership dinner of the Mid-Continent Oil and Gas Association, scheduled for Saturday night at the Coliseum in Tulsa. Some 1,500 persons are expected to attend the dinner, and to hear the industry's leaders discuss the ability of the oil industry to fill any demands that may be levied on it in the country's national-defense preparations.

Principal speaker at the meeting will be Henry L. Luce, president of Time, Inc., New York City, who will discuss the crisis facing America, and effects of the European war.

A feature of the meeting will be a quiz program, in which nationally prominent oil men will answer questions on the petroleum association.

●

THE MARKETS*

CRUDE OIL: The general crude-oil price advance of 10 cents January 2 in Michigan and scattered advances elsewhere reaffirmed the evidence of growing strength in the market. Effective January 1 crude purchasers in New Mexico revised their basis of payment and now pay posted prices on 100 per cent of the tank tables which is the equivalent of a 2 per cent increase in the price. Continental Oil Co. met the lower prices in Southwest Texas fields originally posted by Republic Oil Refining Co. Pan-American Pipe Line Co. entered the East Texas field as a purchaser posting the regular price of $1.10 per barrel. An advance of 6 cents was posted in the Tullos and Urania fields, La Salle Parish, Louisiana.

REFINERY: Distillate fuel oils were advanced an eighth of a cent per gallon in the inland refining districts reflecting the heavy demand from Middle West states. Prices on other products were steady. Growing strength is still evident in the residual fuels. Motor-fuel demand is steady with the trend upward because of the stronger crude market.

TANK-WAGON AND POSTED DEALER: Standard Oil Co. (Indiana) made a general advance of 0.5 cent per gallon in the tank-wagon-kerosene price January 6 at points in its territory that were 0.5 cent or less subnormal. The kerosene advance reflected the higher prices for distillate fuels at the refineries. Scattered adjustments in the other tank-wagon markets were without significance.

FINANCIAL: Oil securities rallied on the strength of optimistic outlook for 1941 consumption. Average of 30 representative stocks for the week ended January 4: High, 24.09; low, 22.97; close, 23.77. Week ended December 28: High, 23.49; low, 22.58; close, 23.14.

*Detailed information in Market Section.

Refinery Expansion

Gladewater Refining Co. Plans Line to Hawkins Discovery

DALLAS, Tex.—Pending completion of plans for the construction of a pipe line from the new Hawkins field in Wood County, Gladewater Refining Co. is trucking oil from the field to its 3,000-bbl. plant at Gladewater, Tex. Gene Ames of the Gladewater company said plans call for immediate construction of a 14-mile line to the new field.

North Star Expands Plant At Winnipeg, Canada

WINNIPEG, Manitoba.—North Star Oil, Ltd., has expanded its 800-bbl. refining plant here to take additional quantities of Turner Valley crude. The plant is of the skimming type.

Runs to Stills Suspended At Bradford Oil Refinery

BRADFORD, Pa.—Runs of crude oil to stills have been suspended at the plant of the Bradford Oil Refining Co., at Foster Brook, officials of the company said, but they made no statement on reports that the plant might be closed. Some quarters believed that the plant would operate for some time with a curtailed force to liquidate inventories of refined products.

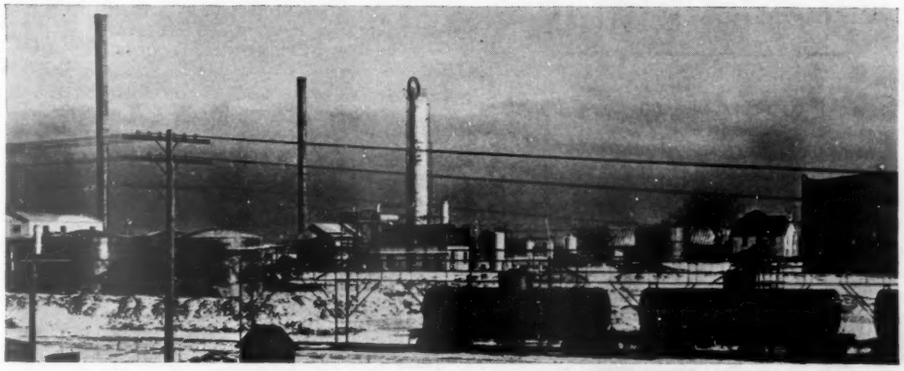
The company, like other small firms in the region, has experienced difficulties in recent months due to the relationship between the price of crude and the realization from refined products. On June 29 when the posted price for Bradford crude was $2.25 the company cut its price for crude 25 cents and reduced it an additional 25 cents when the posted price was cut that amount on August 8. Later it increased the price by 10 cents.

The plant, employing more than 100 workers, has a capacity of 2,500 bbl. daily. It has been in business here since 1923 and made a number of improvements in recent years, following the sale of bonds and common stock to a group of underwriters.

Construction Under Way on Plant Of Douglas at Los Angeles

LOS ANGELES, Calif.—Construction work on the 8,000-bbl. refinery of Douglas Oil & Refining Co. at Main and East Road in Los Angeles County has been started with plans calling for its completion in the near future. Processing equipment will include a two-coil selective Dubbs cracking unit with crude-distillation equipment. The unit was designed by U.O.P. engineers, including treating equipment and other auxiliaries, with the construction work being done by Fluor Corp. of Los Angeles. Design provisions have been included for future increases in capacity and for the addition of a U.O.P. catalytic polymerization unit.

WISCONSIN'S FIRST REFINERY PLACED IN OPERATION



The newly completed oil refinery of the Wisconsin Oil Refining Co., Inc., has been placed in operation—the first oil refinery to be established in Wisconsin. The plant is located at Sheboygan on a 50-acre tract south of the city of U. S. Highway 141. The daily refining capacity is 5,000 bbl. The refined products of the company include gasoline, kerosene, domestic heating oils, diesel and tractor fuels, and industrial fuel oils. The output of the refinery will be marketed to independent oil jobbers and industries in Wisconsin and Upper Michigan.

The erection of the refinery started in July 1940, soon after the completion of the organization of the company. In addition to D. E. Foster, who heads the company as president and general manager, the officers include William H. Pauly of Manitowoc, chairman of the board of directors; Walter H. Wingrove of the Wingrove Oil Co., Sheboygan, vice president; T. H. Spence of Quarles, Spence & Quarles, Milwaukee, secretary, and John Heronymus of Heronymus, Ballschmider & Co., Sheboygan, treasurer. Other directors of the company are G. B. McKinley of Sheboygan and John A. Crawford, superintendent of the company.

Crude oil produced in the southern Illinois oil fields is used in the refining operations. The oil is shipped to Sheboygan in tank cars and delivery is made over the lines of the Chicago & North Western Railway. Shipments of the refined products from the refinery will be made in tank cars and motor tank trucks.

The company contemplates the erection, during 1941, of additional refining facilities including Dubbs cracking and catalytic polymerization units. These additions will enable the company to derive a maximum yield of high-quality gasoline from its operations.

News of Pipe-Line Activity, which was formerly found on this page, will be found on Page 53.

Natural Gas

Revenues of Gas Utility Companies Gain 5.7 Per Cent in October

NEW YORK.—Revenues of natural and manufactured-gas utilities amounted to $64,985,000 in October 1940, as compared with $61,493,400 for the corresponding month of 1939, Paul Ryan, chief statistician for the American Gas Association, has reported. This represented an increase of 5.7 per cent. Revenues from industrial and commercial users rose from $22,311,100 in October 1939 to $23,492,400 in October 1940, a gain of 5.3 per cent. Revenues from domestic uses amounted to $41,492,600, a gain of 5.9 per cent over the figures reported in the previous year.

The natural-gas utilities reported revenues of $33,296,000 for the month, or 7.9 per cent more than for October 1939. Revenues from sales of natural gas for industrial purposes gained 4.5 per cent, while the increase in revenue from sales for domestic purposes was 11.1 per cent. The manufactured-gas industry reported revenues of $31,689,000 for the month, an increase of 3.4 per cent from the same month of the preceding year. Revenues for industrial purposes increased 10.4 per cent while commercial revenues increased 3.6 per cent. Revenues from domestic uses were 1.4 per cent more than for the corresponding month of 1939.

Michigan Commission Authorizes Outlet for New Gas Area

SAGINAW, Mich.—The Michigan Public Service Commission on January 3 authorized Consumers Power Co. to construct a pipe line providing a natural-gas outlet from new Michigan fields in Clare, Osceola and Missaukee counties, Michigan. Commission engineers said the line will provide a test of the rate of pressure decline by which reserve of the fields, together considered the second largest gas area in Michigan, may be determined. Consumers Power Co. plans to place 38 miles of 12-in. line to connect its pipe-line system near Midland with fields of total proven acreage, estimated at 7,500 acres, now the location of 16 producing wells.

Natural Gasoline

California Natural-Gasoline Output Drops in November

LOS ANGELES, Calif.—Production of natural gasoline in California totaled 48,520,286 gal. in November 1940, the Bureau of Mines reported here last week. This monthly production compared with 51,514,967 gal. in the previous month, or on a daily average basis the November figure of 1,617,000 gal. compared with 1,661,000 gal. in October 1940. The total production represented the output of 86 plants, with a daily operating capacity of 1,978,300,000 cu. ft. daily, processing 30,895,442,000 cu. ft. daily.

Following is a summary of the plants' operations during November:

	Gas treated (M.c.f.)	Natural gasoline produced (gal.)
San Joaquin Valley:		
Beiridge	3,873,363	2,177,862
Elk Hills	306,049	302,884
Kettleman Hills	8,446,145	10,692,412
Midway-Sunset	840,335	1,644,789
Mountain View	174,279	247,449
Miscellaneous	1,530,186	1,060,483
Coastal district:		
Elwood	325,645	424,865
Santa Maria	176,197	442,074
Ventura Avenue	3,396,682	5,010,785
Miscellaneous	629,421	657,533
Los Angeles Basin:		
Brea-Olinda-Coyote	424,984	1,522,787
Dominguez	1,372,300	2,027,285
Huntington Beach	727,448	2,531,474
Long Beach	2,111,797	7,403,614
Montebello	1,982,432	1,998,686
Richfield	183,056	593,035
Rosecrans	1,371,614	1,588,001
Santa Fe Springs	1,234,671	4,602,741
Torrance	212,683	693,735
Miscellaneous	1,576,155	2,897,092
Total (all fields)	30,895,442	48,520,286
	Gallons	Gallons
Stocks beginning of month	2,290,394	
Production during month	48,520,286	
Delivered to refineries		48,675,094
Delivered to jobbers, brokers, blenders		
Blended at plants for production of motor fuel		15,641
Losses		56,683
Stocks end of month		2,063,262
Total	50,810,680	50,810,680
Liquefied pet. gas prod.	4,920,000 gal.	= 117,143 bbl.
Motor-fuel production	15,551 gal.	= 370 bbl.

PROGRAMS AND MEETINGS

Western Petroleum Refiners Association To Meet in Shreveport This Week

First in the 1941 series of technical group meetings of the Ark-La-Tex division of Western Petroleum Refiners Association, will be held on Friday, January 10, at the Washington-Youree Hotel, Shreveport, La., beginning at 4 p.m. It has been announced that the January meeting will be another of the popular questions and answers series. The entire time allotted for this meeting will be devoted to a discussion of as many as possible of the 50 questions which have been submitted by refiners in various sections of the tri-state area.

A. W. Trusty, chief chemist of the Arkansas Fuel Oil Co., will again serve as chairman. Refiners throughout the area are invited and expected to attend the meeting.

Form New Association

The gas producers of the shallow, stripper gas territory of eastern Kansas and Missouri have formed an association to be known as the Gas Producers Association. The object of the association is to promote better cooperation between pipe lines and producers.

Change Date of Meeting

The Petroleum and Natural Gas Conference, originally scheduled to be held at State College, Pa., April 25-26, will be held May 2-3, according to an announcement by Sylvain J. Pirson, of Pennsylvania State College. The change in date was made because of a conflict in dates with the Natural Petroleum Association meeting in Cleveland, Ohio.

Petroleum Accountants Society Will Meet in Tulsa, January 9

The December meeting of the Petroleum Accountants Society of Oklahoma, which was deferred because of the holidays, will be held Thursday, January 9, in the Ivory Room, Mayo Hotel, Tulsa, at 6 p.m. Two subjects devoted to current topics of popular interest at this time will be presented. Guest speaker will be Capt. Maxwell W. Balfour, director of the Spartan School of Aeronautics, Tulsa. He will speak on "Our National Defense and Its Relation to the Oil Industry." Fay T. Anderson, secretary of the society, will discuss "Forecasting Business Conditions Under Dow's Theory." Entertainment will be provided by the "Endemacs," a male quartet.

Illinois Institute of Technology Will Be Host to Midwest Power Conference

The 1941 meeting of the Midwest Power Conference will be held April 9 and 10, at the Palmer House, Chicago. This conference is sponsored annually by the Illinois Institute of Technology with the cooperation of seven other midwestern universities and colleges and the local sections of the Founder and other engineering societies. The tentative program of the meeting includes sessions on central-station practice, stationary prime movers and plant auxiliaries, hydro power, electric-power transmission and distribution, feed-water treatment and industrial power plants.

Oil-Burner Show Looms As Record Breaker

That the National Oil Burner Progress Exhibition and Convention sponsored by Oil Burner Institute to be held at Commercial Museum, Philadelphia, Pa., March 17-22, 1941, will be the largest ever held is apparent from space figures released by C. F. Curtin, secretary of Oil Burner Institute.

As of November 23, over 80 per cent of the exhibition space has been taken. The total number of booths sold to oil-burner manufacturers, accessory manufacturers, and oil companies is 130, this being far ahead of the corresponding sales for the 1937 Oil Burner Show, the last held.

Set Dates for Gas Association Meet

The twenty-third annual convention of the American Gas Association will be held the week of October 20, in Atlantic City, N. J., according to an announcement by T. J. Strickler, president of the association.

CALENDAR OF EVENTS

January

SOCIETY OF AUTOMOTIVE ENGINEERS, annual meeting and engineering display, Book-Cadillac Hotel, Detroit, Mich., January 6-10.

LOUISIANA ENGINEERING SOCIETY, annual meeting, St. Charles Hotel, New Orleans, La., January 10-11.

MID-CONTINENT OIL AND GAS ASSOCIATION, Kansas-Oklahoma division, annual membership dinner, Coliseum, Tulsa, January 11.

LIQUEFIED PETROLEUM GAS ASSOCIATION, eastern section, regional meeting, New York, January 16-17.

COMPRESSED GAS MANUFACTURED GAS ASSOCIATION, INC., annual meeting, New Nork, January 20-21.

OIL TRADES ASSOCIATION OF NEW YORK, quarterly meeting and dinner, Waldorf-Astoria Hotel, New York, January 21.

NORTHWEST PETROLEUM ASSOCIATION, Radisson Hotel, Minneapolis, Minn., January 23-24.

February

WISCONSIN PETROLEUM ASSOCIATION, annual convention, Milwaukee, Wis., February 11-13.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Engineering Societies Building and Commodore Hotel, New York, N. Y., February 17-20.

KENTUCKY PETROLEUM MARKETERS ASSOCIATION, fifteenth annual meeting and convention, Brown Hotel, Louisville, Ky., February 18-19.

NORTH TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 22.

LIQUEFIED PETROLEUM GAS ASSOCIATION, INC., annual convention, Chicago, February 24-25.

AMERICAN PETROLEUM INSTITUTE, southwestern district regular spring meeting, Washington-Youree Hotel, Shreveport, La., February 27-28.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, Hotel Mayflower, Washington, D. C., March 3-7.

OHIO PETROLEUM MARKETERS ASSOCIATION, Deshler-Wallick Hotel, Columbus, Ohio, March 4-6.

NATIONAL DIXIE DISTRIBUTORS, INC., Fort Worth, Tex., March 10.

AMERICAN PETROLEUM INSTITUTE, Pacific Coast District, Division of Production, regular spring meeting, Biltmore Hotel, Los Angeles, Calif., March 11.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners' and suppliers' exhibit, Hotel Severin, Indianapolis, Ind., March 11-13.

OKLAHOMA UTILITIES ASSOCIATION, annual meeting, Tulsa, March 17-18.

OIL BURNER INSTITUTE'S NATIONAL OIL BURNER PROGRESS EXHIBITION, Commercial Museum, Philadelphia, Pa., March 17-22.

MID-CONTINENT CHAPTER, AMERICAN PETROLEUM INSTITUTE, spring convention, Amarillo, Tex., March 21-22.

OIL TRADES ASSOCIATION OF NEW YORK, annual meeting, Waldorf-Astoria Hotel, New York, March 25.

April

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-sixth annual meeting, Rice Hotel, Houston, Tex., April 2, 3, and 4.

AMERICAN CHEMICAL SOCIETY, St. Louis, Mo., April 7-11.

MIDWEST POWER CONFERENCE, fourth annual meeting, Palmer House, Chicago, April 9-10.

SOUTHWESTERN GAS MEASUREMENT SHORT COURSE, College of Engineering, Oklahoma University, Norman, Okla., April 15-17.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, Arlington Hotel, Hot Springs, Ark., April 16-18.

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, regular spring meeting, William Penn Hotel, Pittsburgh, Pa., April 17-18.

NATURAL GASOLINE ASSOCIATION OF AMERICA—Annual convention, Baker Hotel, Dallas, Tex., April 23-25.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Mayo Hotel, Tulsa, April 23-25.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 24-25.

May

PETROLEUM AND NATURAL GAS CONFERENCE, State College, Pa., May 2-3.

AMERICAN GAS ASSOCIATION, Natural Gas Section, Dallas, Tex., May 5-8.

AMERICAN PETROLEUM INSTITUTE, eleventh midyear meeting, Mayo Hotel, Tulsa, May 19-23.

NATIONAL OIL SCOUTS AND LAND MEN'S ASSOCIATION, annual convention, Dallas, Tex., May 29-31.

June

AMERICAN SOCIETY FOR TESTING MATERIALS, forty-fourth annual meeting, Palmer House, Chicago, June 23-27.

September

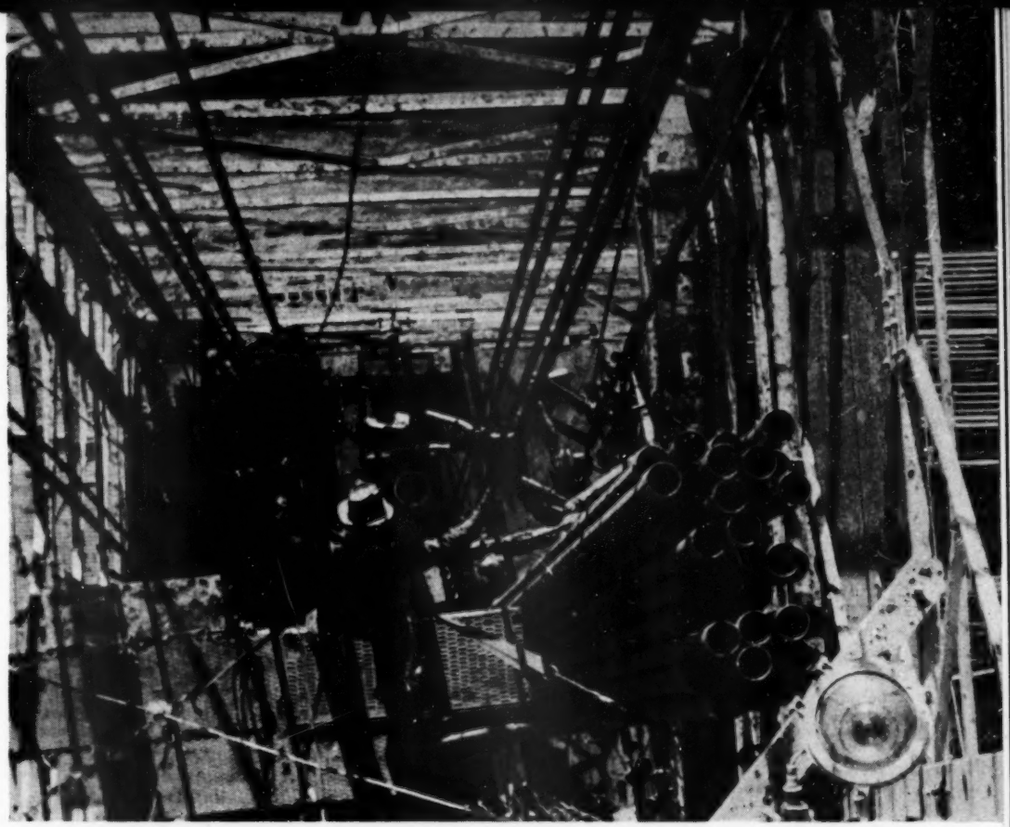
AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, East Texas chapter, annual convention, Adolphus Hotel, Dallas, Tex., September 25-27.

October

AMERICAN GAS ASSOCIATION, twenty-third annual convention, Atlantic City, N. J., October 20-25.

November

AMERICAN PETROLEUM INSTITUTE, twenty-second annual meeting, San Francisco, Calif., November 3-7.



A major difference in drilling technique in the Mid-Continent and California operations is the equipment used in the derrick and the manner of racking the drill pipe. Accompanying photograph was taken from a derrick over a hole in the Ten Section field of California in which drill pipe was replaced by tubing. Note that the pipe is racked at the side of the derrick instead of in front of the drum; also that the monkey board is parallel to the sheaves in the traveling block instead of being normal to them as in Mid-Continent practice. An article on use of tubing for drill pipe appears on Page 32

ENGINEERING & OPERATION

In This Section

JANUARY 9, 1941

SHELL DRILLS 8,200-FT. WELLS IN CALIFORNIA WITH TUBING
By L. P. Stockman ..... Page 32

In the Ten Section field of California, Shell Oil Co., Inc., has adopted use of regular tubing in place of drill pipe in drilling 8,200-ft. wells. After the wells have been drilled and the bit removed from the drill tubing, a perforated cementing-and-liner section is installed and the tubing run as casing and cemented in place. Very little increase in drilling time has been experienced.

ADMIXTURES AND CHEMICALS USED IN DRILLING FLUIDS
By Harry F. Simons ..... Page 34

While all drilling wells make some mud, usually the natural mud must be treated to build up its desirable qualities and minimize its undesirable ones. Use of the more common admixtures and chemicals employed at the present time and the effect to be gained from each are discussed. Economy of selecting materials on the basis of yield rather than on a cost basis is also dealt with.

CALCULATING PERCENTAGES IN A TWO-COMPONENT SYSTEM
By T. W. Brinkley ..... Page 37

Part of the duties of the oil-field engineer is to compute the percentage relationship between the oil and salt-water produced by wells under his supervision so that a chart for calculating these percentages is almost a necessity. Here a chart for computing this relationship is presented, though it may be used for calculating the percentage relationship of any two-component system.

CETANE NUMBER AND CHEMICAL COMPOSITION
By T. Y. Ju and C. E. Wood ..... Page 41

A series of experiments has been and is being carried out at the University of Birmingham, England, to determine the cetane numbers of certain pure hydrocarbons. Some of the results of these experiments are presented, along with discussions on combustion of oil in compression-ignition engines, delay period and diesel knock, ignition quality of fuels and cetane and cetane scales.

OPERATING IDEAS ..... Page 40

SAFETY: Longer Rathole Pipe Raises Drive Bushing ..... Page 46

QUESTIONS ON TECHNOLOGY—W. L. Nelson ..... Page 48

Shell Drills 8,200-Ft. Wells In California With Tubing

By L. P. STOCKMAN

SHELL OIL CO., INC., which has restricted development work in the Ten Section field of Kern County, California, to the drilling of slim holes exclusively since last June, has recently drilled and completed four wells in the Stevens oil sand below 8,200 ft. by using tubing in place of conventional drill pipe. After the hole is drilled, the tubing is run as casing in the wells. At the present time there are three wells being drilled by this method and a fourth string of tubing is on the rack waiting to be put in use.

Object of this procedure is to eliminate the drill pipe, an item whose cost, maintenance and repair forms a large portion of the drilling expense. The tubing is subjected to shock loads while being used for drill pipe, but is not damaged to an extent which would prevent its withstanding the static load placed on it when used as casing.

Use of tubing as drill pipe is a reversion to the method employed during the early days of rotary drilling, before drill pipe was introduced, when hole was made by rotating casing, or small-diameter pipe, to which had been attached a bit or other cutting tool. This was the method used in drilling the first rotary well at Spindletop, Tex., in 1901. The casing used at that time was very inferior when compared to present-day tubular material, tubing, casing or drill pipe. In fact, the drill pipe used in the early days of rotary drilling was merely extra-heavy casing which frequently parted, collapsed or failed in numerous other ways. Shell Oil Co. is now trying to determine the feasibility of using modern tubing with its high tensile strength and resistance to collapse as an activating medium for the drilling bit.

Use Regular Tubing

The tubing used as a combination drill pipe and casing is 4½-in. o.d., 3.958-in. i.d., 12.75-lb. per ft., upset, Range 2, J.55 tubing having a minimum tensile strength of 95,000 lb. per sq. in. The average ultimate tensile strength of a joint is 215,000 lb.; the maximum setting depth is 9,880 ft. Couplings on the tubing are 5.563 in. in diameter. The tubing is standard in every respect except that the threads and couplings are the Acme type with double-seal joints. Threads are of the six-pitch type with a ¾-in. taper.

In addition to the elimination of drill-pipe depreciation and maintenance costs, the use of the tubing to drill rotary wells reduces the working load on the derrick and hoisting machinery. Formerly, 4½-in. o.d. drill pipe weighing 16.60 lb. per ft. was used. A saving of 3.8 lb. per ft. or 30,400 lb. in the total weight of a string of pipe used to drill an 8,000-ft. well has resulted from the use of the tubing as a drill stem.

Use of a single string of tubing for both a drill string and casing string is particularly well suited to the development program in the Ten Section field as the exact location of the pay formation has been determined and the conditions to be encountered are well known.

A total of 20 slim-hole wells have been drilled to completion in the Ten Section field by Shell Oil Co. during the past 6 months (see table). All development in the field since last June has been by the slim-hole method as no large holes (or normal-diameter holes) have been drilled since that time. Hole drilled from under the surface pipe to top of the pay formation is 8½ in.

Practice at the start of the slim-hole campaign in the Ten Section field was to run 4½-in. water string of casing on top of the pay sand and then run a 3½-in. liner to bottom. This procedure was changed last September when Shell adopted the policy of landing a combination string consisting of 4½-in. tubing with a perforated section on bottom. This string was cemented through perforations located above the productive Stevens sand.

Very little increase in time has been required to drill wells which used tubing over those using conventional drill pipe. The best time made in drilling a well with drill pipe is only 1 day shorter than the best time made in drilling a well with tubing.

The shortest time required to drill a well in the field was on the 52-30-A Kern County Land which required only 23 days from spudding to completion; from spudding to topping the productive Stevens oil sand at 7,977 ft. took only 17 days. This well was slim-hole-drilled with conventional drill pipe. The second best performance was on the 52-29-A Kern County Land, drilled with tubing instead of drill pipe and completed in 24 days after requiring only 18 days from spudding to topping the Stevens pay at 7,985 ft.

Left: Spinning up new stand of drill tubing at a Shell Oil Co., Inc., well in the Ten Section field. The tubing is handled much in the same manner as conventional drill pipe and is afforded the same treatment. Below: Stands of the tubing used as drill pipe. Threads are of a six-pitch type with a ¾-in. taper

It is obvious that the saving effected through the use of tubing is not offset by an increase in drilling time on the wells. The net result is a reduction in the costs of drilling and an approach to maximum efficiency in the development program.

Geology and Lithology

A contributing factor to the success of this method is the geology and lithology of the Ten Section field. The structure is a gently folded anticlinal dome located on the slightly rolling floor of the San Joaquin Valley. Ten Section is the most prolific as far as the productive Stevens oil zone is concerned. No deep prospecting has been undertaken to date and the productive possibilities of the Rio Bravo and Vedder zones are still undetermined. All productive acreage is held by the Shell Oil Co., Inc., under lease from the Kern County Land Co. A total of 78 wells has been drilled in the field to date; total cumulative production to the end of November 1940 is 10,009,469 bbl.

The Pliocene beds which form approximately the top 6,900 ft. of the geologic section in this area are mostly composed of an alternating series of soft to hard and firm claystones, siltstones and loose to slightly consolidated, poorly cemented, easily friable sands. The uppermost beds of the Miocene, the brown shale, are composed of a series of dense, well-indurated, generally well laminated, platy, dark-brown shales. The Stevens zone is made up of a series of sand beds separated by occasional shale streaks. The latter vary in thickness from 10 ft. to in excess of 150 ft., while the interbedded sand members vary in thickness from 15 to 200 ft.

In general, the sands of the Stevens zone are moderately to fairly well cemented, compact, poorly to well sorted, medium-grained to slightly coarse in texture and generally free from fines. Associated with the sand bodies are occasional well-cemented, impervious, sandstone shells, which, by their lack of correlation and their general appearance, are considered to be lenticular or concretionary in nature. Average porosity of the sands comprising the productive horizons is 16 per cent, the range varying from 12 to 25 per cent.

Speed of Rotation

Because of the nature of the formations, practice in the field has been to carry comparatively light weight on the bit (three to five points with eight 1¼-in. lines, or from 10,000 to 17,000 lb.). The rotary table is turned moderately fast, ranging from 200 to 350 r.p.m. For a short time a speed of 400 r.p.m. was attempted but this was not the regular practice and varied from well to well. Weight is concentrated at the bottom of the drill string

through the use of multiple drill collars. No reamers are used in drilling the hole.

The number of bits and core heads varies from well to well in any given field due to the different conditions, but the bit record of one well drilled in Ten Section gives some additional indication of the service to which the tubing used for drill pipe is subjected. The well cited as an example used 33 bits and 6 core heads from top of the ground to completion. A 12¼-in. bit was used for drilling the surface hole, after which sixteen 8½-in. rock bits and sixteen 8½-in. drag bits were used; three soft and three hard-formation core heads were used for coring the oil sand. As the strain on the drill stem varies widely for rock-bit and drag-bit digging, it can be seen that the tubing which was used for drill pipe was subjected to a wide range of torsional loads.

Same Rigs Used

Rig used on the wells drilled with tubing was the same as those used with conventional drill pipe and no changes were effected. Pump pressure was the same, mud being deliveried by a 7-in. pump with a 20-in. stroke. The only change in the drilling setup was permitted by the use of the lighter-weight tubing which made it possible to string only six lines through the blocks instead of the usual eight. This reduced the time necessary to pull the pipe from the hole and reduced the load on the derrick and rig. The tubing was attached to the kelly joint through a special sub.

The tubing used in drilling of slim holes by the company is afforded the same treatment accorded conventional drill pipe and is handled much in the same manner. Approximately 36 round trips are made during the drilling of a well at Ten Section. The only equipment change necessary was the building up of the tong heads to fit the tubing These were built up to 12-in. faces for gripping the tubing without crushing it while breaking out and making up the joints.

Closeup view of stands of the drill tubing showing the tubing collars. Lubrication on the collars shows there is no tendency for washouts. Shiny threads on the couplings or pipe are a forerunner of trouble

The thread on the tubing differs considerably from the tool-joint thread employed on the conventional drill pipe which, in addition to a heavy thread and sharp taper, has a wide shoulder on both pin and box. The practice in making up ordinary tool joints is to snap the shoulders together, using either a sharp jerk on the spinning line or tonging with the backup tongs. The tubing has a thread connection which is braced by a shoulder on the exterior of the pipe, mating with a shoulder on the inside circumference near the end of the coupling. This type connection cannot be snapped up without danger of damaging the thread connection and seal. The procedure at Ten Section is to spin up the tubing as far as possible with a spinning line and then tong it until the shoulders mate and the connection is tight.

The increase in time occasioned by this procedure was more than offset by the reduction in time required in breaking out the pipe while coming out of the hole. Normally both pair of tongs are employed with regular tool joints but with tubing only the lead tongs are necessary for a backup, the connection being broken and spun out with the rotary table.

Delay due to difficulty in stabbing the tubing, which had a smaller taper (¾ in.) than the conventional tool joints, did not materialize as the decrease in weight made the tubing easier to handle.

Trouble experienced while using tubing for drill pipe was no more than that normally experienced with the conventional drill pipe and tool joints. There were no washouts and no twistoffs in the drilling of the four wells. Total replacements throughout the drilling of more than 32,000 ft. of hole consisted of five joints. Two joints were kinked during the drilling of the first well and were laid down; two more suffered galled threads and were

(Continued on Page 36)

SLIM HOLES COMPLETED ON KERN COUNTY LAND LEASE IN TEN SECTION FIELD, CALIFORNIA, BY SHELL OIL CO.

Well number	Section, township, range	Total depth	4½-in. combination oil string: Landed	C.P.	Perforations	3½-in. liner: Length	Perforations	Tubing: 2-in. hung	2½-in. hung	Initial prod.: Barrels daily	M.c.f. gas	Gravity of oil	Date completed 1940	Total elapsed drilling time, days
85-30-A	30-30-26	8,422 P.B. 8,195	8,195	7,980	7,981-8,150 8,160-95	...	...	7,975	....	2,116	3,613	35.1	Dec. 7	30
23-29-A (B)	29-30-26	8,235	8,235	8,055	8,056-8,170 8,189-8,235	...	...	8,050	....	2,182	1,863	33.7	Nov. 27	29
36-29-A (B)	29-30-26	8,351 P.B. 8,250	8,250	7,959	8,075-8,144 8,155-8,250	...	...	7,957	....	2,299	3,864	34.6	Nov. 25	39
45-30-A (B)	30-30-26	8,220	8,220	8,030	8,031-8,118 8,128-8,220	...	...	8,018	....	825	2,450	33.4	Nov. 24	34
25-28-A	28-30-26	8,220	8,219	8,023	8,024-69 8,109-8,219	...	...	8,008	...	1,653	1,233	32.5	Nov. 4	37
83-30-A	30-30-26	8,235	8,235	8,032	8,033-8,200 8,210-35	...	...	8,022	....	2,295	2,224	33.7	Oct. 28	29
63-30-A	30-30-26	8,220	8,220	7,965	7,970-8,040 8,070-8,220	...	...	7,843	...	2,361	2,269	33.8	Oct. 20	26
43-30-A	30-30-26	8,220	*7,952	....	...	281	7,947-8,085 8,110-90 8,200-20	....	7,937	2,602	2,305	33.7	Oct. 15	27
2-29-A	29-30-26	8,235	8,235	7,950	7,955-8,045 8,096-8,235	...	...	....	7,951	2,236	1,840	33.8	Sept. 28	33
52-29-A (B)	29-30-26	8,235	*7,985	....	...	271	7,985-8,114 8,145-8,235	7,957	....	1,685	1,441	33.9	Sept. 28	24
78-29-A	29-30-26	8,220	*8,071	....	...	168	8,075-85 8,110-8,215	....	8,042	1,118	924	32.7	Sept. 23	38
52-30-A	30-30-26	8,220	*7,977	....	...	255	8,000-50 8,080-8,220	7,958	...	2,977	1,713	34.6	Sept. 17	23
32-30-A	30-30-26	8,236	*7,930	....	...	326	7,951-95 8,036-8,146 8,166-8,236	7,906	....	2,196	1,575	35.1	Sept. 1	31
21-29-A	29-30-26	8,235	*7,959	....	...	285	7,985-8,025 8,055-8,170 8,195-8,235	7,945	....	1,632	1,302	34.5	Aug. 24	27
81-30-A	30-30-26	8,210	*8,010	...	...	219	8,025-50 8,100-8,210	7,995	....	1,145	846	34.9	Aug. 24	36
2-30-A	30-30-26	8,200	*7,950	....	...	266	7,978-8,034 8,064-8,104 8,150-8,200	7,925	....	2,037	1,543	34.8	Aug. 14	35
6-28-A	28-30-26	8,220	*7,990	...	...	250	8,015-70 8,110-40 8,152-8,220	7,965	....	1,288	845	31.4	Aug. 1	31
41-30-A	30-30-26	8,210	*8,175	....	...	55	8,175-8,210	....	8,150	1,304	965	34.6	July 26	36
61-30-A	30-30-26	8,220	*8,170	....	...	71	8,170-8,220	8,147	....	731	620	35.2	July 18	46
21-30-A	30-30-26	8,190	*8,018	....	...	192	8,035-8,104 8,128-90	....	7,981	1,735	1,297	35.5	July 8	39

*Cementing point in conventional manner. B—Drilled with tubing instead of drill pipe.. C.P.—Cemented through perforations.

Admixtures and Chemicals Used in Drilling Fluids

By HARRY F. SIMONS

Use of the more common admixtures employed at the present time and the effect to be gained from each are discussed in this article, the sixth of a series dealing with rotary drilling fluids. Economy of selecting materials on the basis of yield rather than on cost of the material is also dealt with. Other articles of the series, covering the purpose of drilling muds, surface and mechanical factors, effects of different properties and tests for determining properties of muds, appeared in the September 26, October 10, October 31, November 21 and December 12, 1940, issues of The Oil and Gas Journal.

ALL drilling wells "make" some mud, the quantity and quality depending on the formations penetrated and the care given to the drilling fluid. Some fields are noted for their mud-making characteristics and in these areas little investment must be made for materials to build up the quality of the mud. Unfortunately, this is not often the case and the natural mud made by the well must be treated to build up its desirable qualities and minimize its undesirable ones. The cost of treatment varies widely from a few dollars in the simplest cases to the $50,000 or more in the more difficult wells.

Practically all materials used in mud treatment can be divided into five classes: native clays, colloidal clays, weighting agents, chemicals and plugging agents. One or all of these may be needed during the drilling of a well. In some cases it may be necessary to replace all of the mud in the system and several of these materials will be used simultaneously.

Native Clays

Native clays and shales include a wide range of materials and each area has its own product which is generally marketed under a name which is closely associated with its source. There are Ada mud, Shaffer Lake clay, Ville Platte clay, and in California there are Mojave, Ventura, Coalinga. Palos Verdes and Lebec muds. The list is endless. These are generally purchased in quantity from the company which mines the material and are mixed at the well. In foreign operations it is necessary not only to locate suitable deposits of clay or shale with which to make mud, but to install and operate a plant for the preparation of the drilling fluid.

Principal use of native clays is to provide bulk to the drilling fluid. The product obtained by mixing these native materials with water is very similar to that obtained from the formations penetrated in areas having a high percentage of clays and shales. They are used when it is necessary to replace the entire mud system. Used with a colloidal material a mud having a high viscosity may be obtained and native clays are used widely for this purpose. Some of these materials react very favorably when treated with chemicals. They are seldom suitable for a weighting agent as their specific gravity is low; they are, however, often used with weighting materials to prevent separation.

To discuss all of the native clays used in drilling mud would be practically an endless task as they vary widely in composition and character depending on their origin. In some cases the quality of a particular clay will vary from day to day, depending on the portion of the deposit being worked and the care with which it is mined and ground. In many cases the material is not ground at all but is simply mined and sacked.

Some of the native clays do have marked colloidal characteristics and some are quite thixotropic. Others have a relatively high specific gravity and make a modified weighting agent. Generally, they are inert and cannot be used alone for controlling either weight or viscosity.

One reason why native clays are so widely used is their low price per ton. This is a problem which needs close examination by the contractor and oil company as the investment should be considered in terms of satisfactory mud produced and not in tons of dry mud purchased. In many cases, materials having a higher per ton cost are less expensive than the cheaper materials. The economy of using native clays must be decided on the merits of the individual case after tests have been made to determine the characteristics of the mud produced.

Where several native clays are available, the choice naturally depends on which one gives the best results in terms of viscosity, specific gravity and thixotropy. Another feature to be considered is the reaction of the native clay to chemical treatment, some clays requiring large quantities of viscosity-reducing agents to obtain the desired effect.

Better results could possibly be obtained from the use of native clays if the user supervised their manufacture, or at least took into consideration their manufacture while mixing them into mud. Amount of mud obtained per ton of native clay used will depend to a great extent on how finely it is ground and what condition it reaches the well. Generally poor treatment is accorded the native clay and following grinding it is placed in a burlap sack where it is not protected from moisture. Instead of reaching a well in a condition suitable for mixing in the regular hopper-type mixer, it generally is very lumpy or the particle size is too large. A sieve analysis of such clays would show most of it being retained on a very coarse screen. If an appreciable quantity of native clay is to be used, a paddle-type mixer would help in breaking down the particle size. In California the native clay is hauled from the mine in trucks, either in a solid or liquid condition.

Above: Proprietary bentonite, barytes and salt-resistant drilling clay stored in a steel building on a drilling site

Left: Caustic soda, bark tannins and complex phosphates waiting in an open shed for use in the drilling fluid on a deep test

Colloidal Clays

The most widely used material for increasing the desired properties of rotary drilling fluid are colloidal clays. There are very few wells drilled at the present time which do not use at least a half-

"GULF PARVIS OIL helps us maintain *Peak Efficiency*"

Says Chief Engineer

"Thanks to the Gulf Engineer, we know how important it is to keep a constant check on lubrication—he has helped us get greater efficiency," *says this Chief Engineer.*

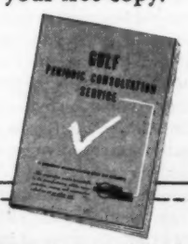
"GULF PERIODIC CONSULTATION SERVICE proved that lower maintenance costs were possible in our plant"

GULF PARVIS OIL helps to keep our Diesels in perfect operating condition," says this Chief Engineer. "It's the most satisfactory Diesel lubricant we've ever used. Our maintenance costs are lower, and we get better protection for cylinders, bearings, and pistons."

More than 50 leading Diesel manufacturers recommend Gulf Parvis Oil for use in the Diesels they build! Many outstanding records of low-cost Diesel operation are being made with Gulf Parvis Oil. Ask the Gulf Engineer how you can benefit from GULF PERIODIC CONSULTATION SERVICE. Through this practical service plan you can improve the operation of your Diesels and reduce maintenance costs. Write or phone your nearest Gulf office today!

GULF INDUSTRIAL LUBRICATION

This booklet will suggest to you a practical method by which you can improve production and reduce operating costs. Write for your free copy.



Gulf Oil Corporation - Gulf Refining Company
3813 Gulf Building, Pittsburgh, Pa.

Please send me my copy—no charge—of the booklet "GULF PERIODIC CONSULTATION SERVICE."

Name.....

Company.....

Address.....

dozen sacks of some colloidal clay and on some wells several freight-car loads of this material may be used. The principal advantage is the small volume of material required to produce the desired changes in viscosity, filtration characteristics and thixotropy.

Colloidal clays are composed chiefly of natural materials which are mined and mixed in a carefully supervised manner. Impurities and undesirable foreign material are kept to a minimum. The most common constituent of colloidal clays is bentonite, a rock containing volcanic ash. Deposits of bentonite are scattered over the country, but that quarried in some localities is much superior.

True bentonite has the ability to become dispersed throughout many times its own weight of water, a colloidal mixture resulting. The suspension formed will have a much greater volume than the water and bentonite which compose it. This fluid will have a high viscosity-weight relationship, will be thixotropic, will deposit a thin but impermeable sheath on the walls of the hole, will have an increased ability to carry the cuttings from the hole, react readily with chemical reagents and will aid in carrying any weighting material added to the mud.

There are several explanations for the action of bentonite, but they are all too lengthy to be included here. Its structure does affect its use and the manner in which it should be mixed. The material is ground and placed in moistureproof bags for shipment and arrives at the well in good condition. It does not absorb water instantly and should be mixed slowly to allow for a breaking down of the particles. Premixing in a tank with warm water or repeatedly running the mixture through a jet-type mixer will give the best results. The greater the dispersion of the particles the more benefit obtained from a unit volume of the bentonite. Some colloidal clays are specially prepared for use in areas where salt is encountered. The normal action of salt on bentonite is to cause flocculation but with the special clays this tendency is reduced. There are also commercial compounds available which, when added to the mud, produce a colloidal mixture which is not affected by the salt in the formation. The water loss can thus be reduced to the point where it will not be dangerous.

Weighting Materials

For increasing the specific gravity of drilling fluid there are relatively few materials used. The best weighting material is one which is composed of finely divided particles of high specific gravity, which will remain suspended, will not affect the wall-building properties of the mud adversely, will be chemically inert, and will not increase the viscosity beyond the range desired.

The most widely used weighting agent is barytes or barium sulfate. It has an average specific gravity of 4.2 and can be readily used to make a fluid having a specific gravity of 2 (16.5 lb. per gal.). Higher specific gravity of drilling mud can be obtained with barytes if desired. This material does require a small amount of colloidal material to keep it in suspension. This latter quality is in itself an aid as it eliminates the danger of an unwanted viscosity rise while weighting a mud.

Another material for increasing the weight of the drilling fluid is amorphous silica which has a specific gravity of 2.6. Because of its comparatively low specific gravity, the weight obtained from its use is necessarily limited. Some types of this material show little tendency to increase the viscosity of the fluid.

A material which at different times has been used for weighting mud is iron oxide which has a distinct advantage in having a high specific gravity (4.6). The principal difficulty has been due the inclusion of soluble salts in the material which results in a flocculation of the mud. Amorphous iron oxide with the soluble salts removed and finely ground to promote suspension in the drilling fluid will make a mud having a weight of 20 lb. per gal. (sp. gr. 2.4).

Strontium sulfate is also used as a weighting material, although it has a definite colloidal action and requires that some chemical treatment be used concurrently. It has a specific gravity of 3.6.

Chemicals

Chemical treatment of mud was started about 10 years ago but it has been during the last four years that this method has made rapid progress. The original treatments were made to control the alkalinity and acidity of the drilling fluid, as it was noted that a relationship existed between the pH and the viscosity and other properties of the mud. Further study of this problem has shown investigators that the effect of the chemicals on the mud structure is the more important factor which may or may not be indicated by the pH of the drilling fluid.

In addition to the regular treatments, some very unusual chemical applications have been tried when special effects were desired. Some have proven total failures. The net result has been an increase in the knowledge of mud chemistry and the treatment which is unusual today may become the standard tomorrow.[40]

The action of the different chemicals on mud is too involved for discussion here. The more common chemicals come under one or two headings, flocculants or deflocculants. The former will aid in a gathering of the particles in the fluid to form flocs while the latter will disperse these flocs. In some cases chemicals of both types are used to obtain the desired effect.

The most commonly used chemical is sodium hydroxide (caustic soda) which was formerly used to control the pH but which is now seldom used alone. It is generally employed in the preparation of other compounds, particularly the plant tannins. Sodium carbonate (soda ash) is an alkali which can be used to control the pH. Both of these materials are flocculants which will cause the mud to have a high viscosity but other desirable qualities (thixotropy, wall building, low water loss) will be lacking.

A chemical for the deflocculation of drilling mud frequently seen on drilling rigs today is tannin in one of its various forms, quebracho, chestnut extract, and gallic acid; the tannin is used with sodium hydroxide to produce sodium tannate. The complex phosphates[41 42 43] are also widely used for dispersion of a flocculated mud and for controlling viscosity of drilling fluid although the orthophosphates are used as flocculants. The phosphates most commonly employed are trisodium-ortho, disodium-ortho, monosodium-ortho, tetrasodium-pyro, sodium-tripoly, sodium-tetra, sodium-meta, sodium-hexameta and sodium-acid-pyrophosphate.

Pyrophosphate will deflocculate mud quickly but its effect is not permanent; accumulations of pyro tend to increase the viscosity after the most effective concentration has been exceeded. Metaphosphate is available commercially as hexametaphosphate. It is water soluble, almost neutral in pH, is an effective deflocculant and fairly high concentrations can be used; however, it reverts to the normal phosphate in presence of heat. Tetraphosphate is almost neutral, is quite stable in solution and retains its deflocculating effect at high concentrations; its only drawback is caused by high temperatures which cause it to revert.

Sodium silicate (water glass) is a deflocculating agent as long as the concentration is kept low but high concentrations result in a flocculating effect. Sodium metasilicate is the most common form of the sodium silicates and has been widely used in fighting heaving shale.

Limestone is sometimes employed to flocculate the mud while drilling surface hole but it produces a gelatinous mass having an extremely high viscosity and the mud must be discarded before adding the regular mud to the system. Sodium alginate has and is being used in combating heaving formations. Starch is being used in overcoming the flocculation of the mud due to salt.

In addition to the above, there are several proprietary chemical compounds used for controlling the pH of the mud and for reducing the viscosity by lessening the tendency of the mud to flocculate. Other chemicals are designed for reclaiming cement-cut mud.

Plugging Agents

Any fibrous material may be used to seal off porous formations and the list of items which have been dumped into drilling wells is practically endless. Cotton-seed hulls, cane fiber, and hemp fiber from old ropes are quite commonly used. The chief objection to organic materials is the fermentation which may later cause trouble in maintaining the properties of the mud. Inert matter is much better in this regard as it does not affect the mud. Prepared fibers are available and recently regenerated cellulose flakes were introduced for sealing off formations while drilling and cementing.

References

39. Tickell, F. C. and Stekoll, M. H., "Study of Physical Properties of Rotary Drilling Muds." The Oil and Gas Journal, May 11, 1939, p. 56.
Robinson, W. W., "Chemicals in Drilling and Producing Operations." The Oil and Gas Journal, Mar. 28, 1940, p. 191.
41. Bonnet, C. F., "Complex Phosphates for Deflocculation of Drilling Mud." The Oil and Gas Journal, Feb. 1, 1940, p. 39.
42. Edwards, Donald B., "Mud Control Is Big Problem on Continental Deep Test." The Oil and Gas Journal, Nov. 30, 1939, p. 38.
43. Bonnet, C. F., and Howell, B. N., "Chemicals for Treatment of Drilling Fluids." The Oil and Gas Journal, Oct. 17, 1940, p. 58.

Shell Drills 8,200-Ft. Wells In California With Tubing

(Continued from Page 33)

replaced to eliminate any danger of subsequent trouble. The fifth joint suffered a damaged coupling when struck by the hook after the bit had hit a ledge while going in the hole.

The drill tubing is pulled from the hole as soon as the total depth is reached, the bit removed and the perforated cementing-and-liner sections to go above and opposite the oil zone are installed. The tubing is then rerun as casing and cemented in place. To prevent cementing off the oil zone, a baffle plate is run inside the casing below the cementing perforations and above the perforated production section of casing. The baffle plate is removed by drilling out with a rotary shoe on the 2 or 2½-in. upset tubing; following drilling out of the baffle, the tubing is hung at the desired depth. The tubing is not pulled from the hole after drilling the baffle plate and the rotary shoe is allowed to remain on bottom; the oil is produced through this string of tubing.

The complete casing and tubing pattern thus becomes about 995 ft. of either 9⅝ or 8⅝-in. surface pipe, landed and cemented in a 12¼-in. hole; the combination string of 4½-in. tubing-drill pipe-casing with a perforated section, set and cemented in an 8½-in. hole; and either 2 or 2½-in. upset tubing hung inside the casing. In some cases this program is varied, the 4½-in. tubing-drill pipe-casing being finally run and cemented as a water string immediately above the productive Stevens sand and the hole completed by running 3½-in. perforated liner.

It is the policy of the Shell Oil Co., Inc., to refrain from endorsing the product of any manufacturer and the above data are herewith presented with that stipulation.

Calculating Percentages in A Two-Component System

By T. W. BRINKLEY
Assistant Engineer, Sinclair Prairie Oil Co., Arp, Tex.

MANY wells produce considerable quantities of salt water along with the oil, and part of the duties of the engineer is to compute the percentage relationship between these two fluids. As the figures for a large number of wells must often be handled, a chart for computing this relationship is almost a necessity. In addition such a chart can be used for computing the percentage relationship of any two-component system. It was with this in mind that an effort was made to obtain a suitable chart on which the values could be easily and quickly obtained.

In the percentage equation, $P = A/(A + B)$, the curve on rectangular coordinates, semilog, or log-log paper gives a curve which is asymptotic to $A = 0$ and $P = 100$. Such a family of curves is difficult to construct since they are close together and the interpolation between them is likely to be inaccurate especially in the asymptotic regions. To avoid this difficulty, distorted coordinates were used. This permits the graph to assume straight-line relations with the axis and the percentage graduated scale to become distorted to correspond to the straight line.

By the method of distorted coordinates, any curve can be represented by a straight line. For example, the curve like the one shown in Fig. 1 can be represented by the straight line $M\ N$.

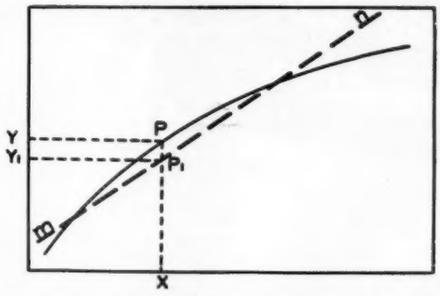


Fig. 1—Diagram illustrating how any curve can be represented by a straight line

The point P is the curve, with abscissa X, and ordinate Y, is lowered to P_1 on the line $M\ N$ so that its new ordinate is Y_1. When every point on the curve has been so transferred to the assumed straight line and the new ordinates are determined, we arrive at a graduated scale which is known to be distorted. Since the line $M\ N$ represents one condition in the two-component system, any other condition will be a straight line and also parallel to the line $M\ N$. Thus, to show any condition would require a family of lines all parallel to one another.

This chart (Fig. 2) was developed primarily for the two-component system of salt water and oil, thereby having a convenient and rapid method of calculating salt-water percentages produced along with the oil. For example: An oil well making 230 bbl. of salt water and 20 bbl. of oil, what is the percentage salt water produced and how many barrels of salt water are lifted with each barrel of oil? Letting component A represent the quantity of salt water and the diagonal lines (component B) represents the oil. Starting at the bottom of the chart where component A is 230 and proceeding upward to the 20 line on component B and then reading horizontally on the percentage scale, showing a salt-water percentage of 92. Proceeding horizontally on the 92 per cent line to the point where it intersects the No. 1 line of the family of lines of component B and then moving downward to the bottom of the chart we read 11.5, which is the number of barrels of salt water lifted per barrel of oil.

This chart is not limited to salt water-oil mixtures, but applies to any percentage or factor problem following the law of $P = A/A + B$. The chart is copyrighted by the author.

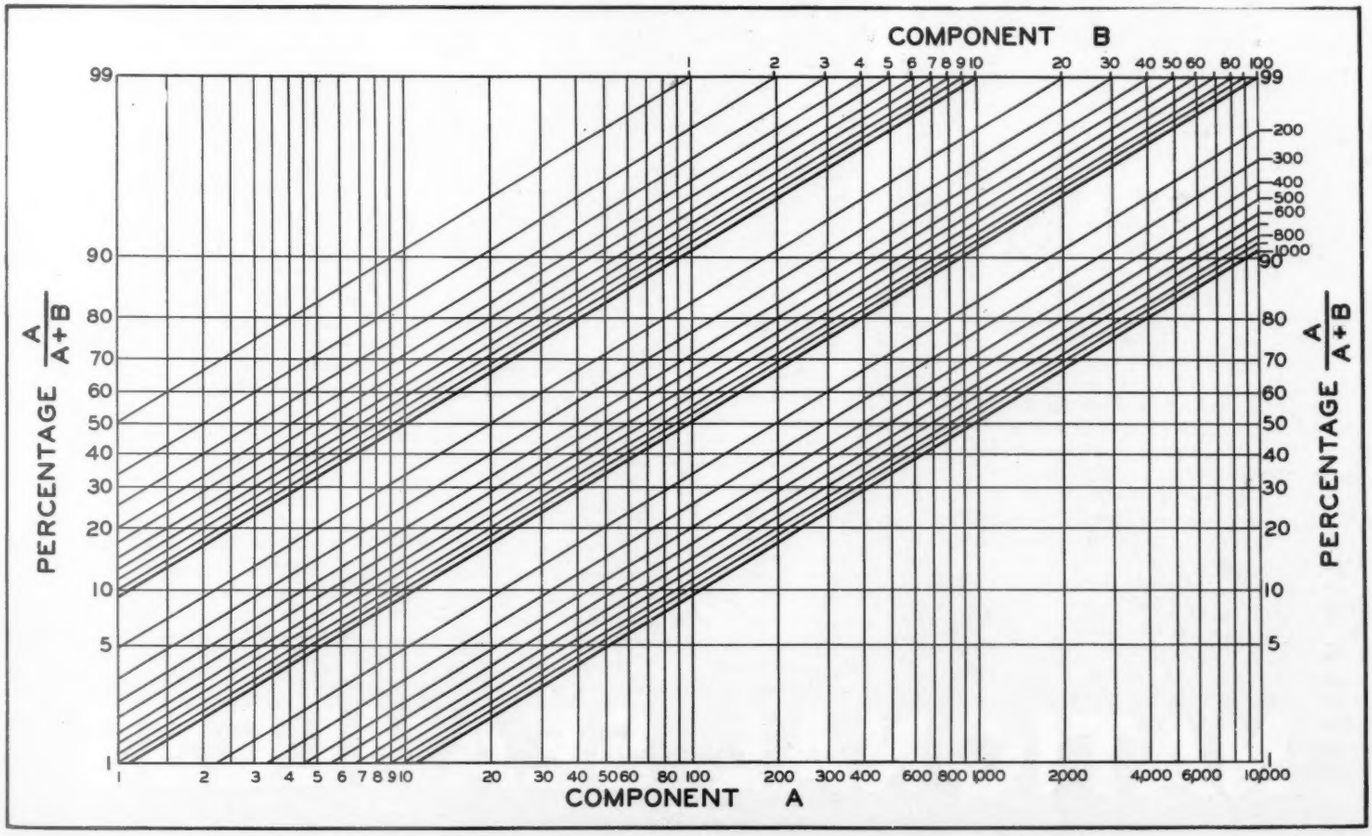
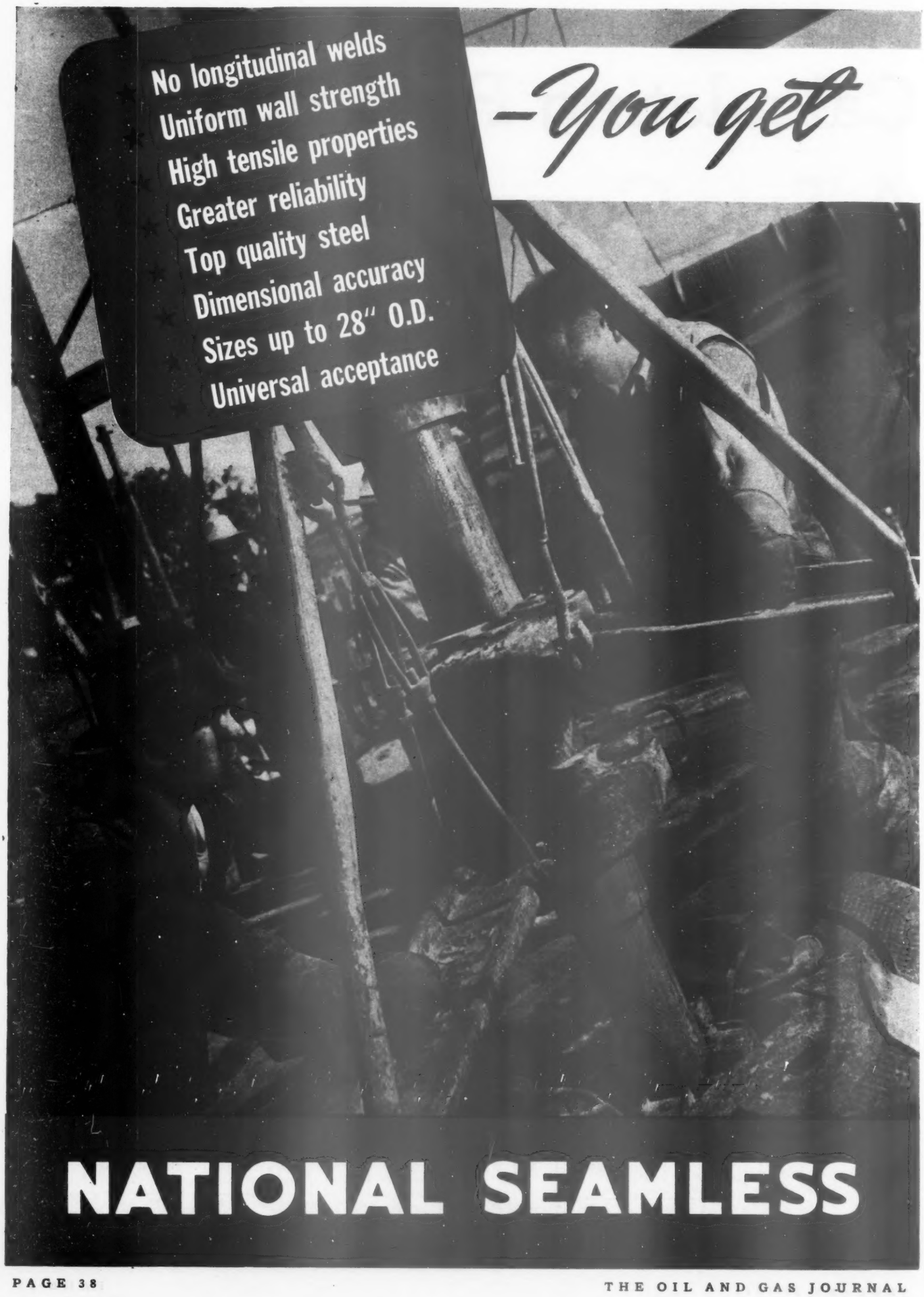


Fig. 2—Chart for calculating percentage relationship of any two-component system


No longitudinal welds
Uniform wall strength
High tensile properties
Greater reliability
Top quality steel
Dimensional accuracy
Sizes up to 28" O.D.
Universal acceptance
-You get
NATIONAL SEAMLESS

them all with

SEAMLESS

THROUGHOUT the oil and gas fields, seamless products have come to mean "the best that money can buy."

Successful operators agree, after long and wide experience, that there's no substitute for seamless—that the only way to get seamless advantages is to use seamless products. Since even the best geologists can't always predict with certainty what you may run into thousands of feet below the surface, it pays to use the best protection you can get against any conditions that might be encountered.

That's why NATIONAL Seamless Drill Pipe, Casing, and Tubing are today first choice with more successful oil and gas men than any other type of tubular goods. Continuous, uniformly high wall strength . . . strong, accurately made threads . . . proved ability to withstand unexpected stresses — these are qualities which account for the unsurpassed reputation of NATIONAL Seamless—"Walls Without Welds."

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

United States Steel Export Company, New York

UNITED STATES STEEL

THESE OUTSTANDING DEVELOPMENTS PIONEERED BY NATIONAL TUBE

To be sure of getting the newest, most up-to-date improvements in Drill Pipe, Casing, and Tubing, always specify NATIONAL Seamless. National's policy is to bring you finer, stronger, tubular goods, and bring them to you First!

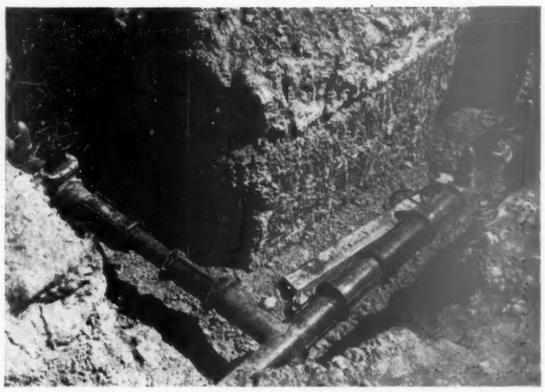
Seamless Drill Pipe
Seamless Upset Tubing
Seamless Long Threads and Couplings
Seamless Grade "D" Casing* (now J-55), also Grade "D" Drill Pipe and Tubing
Seamless Upset Casing
Seamless with Rounded Form of Thread
Seamless with Electro-Galvanized Coupling Threads
Seamless Normalized Tubing for Corrosive Conditions
Seamless Cement-Lined Casing and Tubing

*NATIONAL *Seamless Casing is available in sizes up to 28" O.D., the only seamless casing larger than 16" O.D.*

***NATIONAL SEAMLESS** means pierced from solid billets of finest quality steel. Only sound and flawless steel can be successfully pierced, since any defects in the steel are certain to be exposed by this process. At every stage in production, thorough tests and inspections redouble your assurance that every length of NATIONAL Seamless will display the same uniform wall strength, dimensional accuracy, and uniformity in all physical properties.*

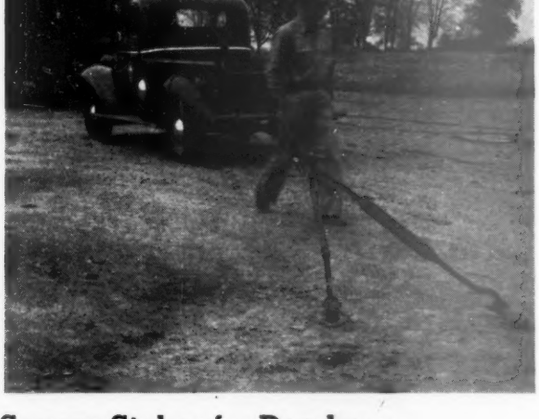
Walls without Welds

Operating Ideas



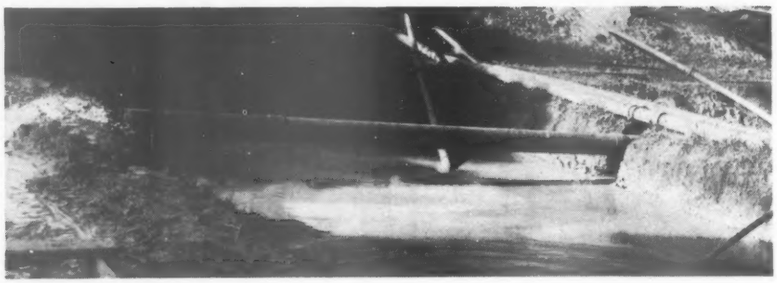
Couplings Permit Scraper Removal

One Illinois company made provisions for cleaning the lines of its salt-water disposal plant by including extra bull plugs and sleeve couplings for the insertion and removal of scrapers. These are located at strategic points and it is a matter of a few moments to insert the scraper and then place the pressure on the line. At points where the scrapers are inserted and removed, the pipe is protected by a board trench instead of being covered with dirt.



Square Stakes for Deadmen

Masts on spudding machines must be guyed if they are to have the desired strength and quite often the digging of a hole and the installation of a satisfactory anchorage are tedious and expensive. One company operating in Illinois has solved this problem by using two square stakes made from solid iron for the anchoring of each guy line. These are driven in the ground about 4 ft. apart and are connected to the guy wire by special links and turnbuckles. Driving the stakes to the ground level is also a safety feature as it prevents a man's falling on them or stumbling over them.

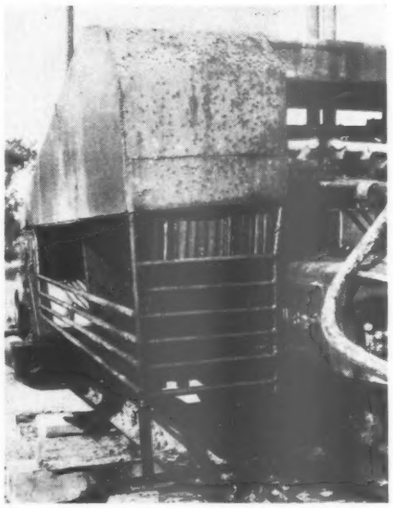


Pipe Flume Speeds Mud Return

By setting a section of 10-in. pipe to span the usual intermediate mud pit, one drilling company makes it easy to speed up the return of mud from the hole to the slush-pump suctions when it is desired to bypass the settling pit, or when special mud is being circulated to meet unusual conditions. The pipe is buried to slightly below mud-ditch level, and may be blanked off with a few shovels full of earth if desired, and normal flow from ditch to settling pit resumed. The reverse of this flow is secured by blocking the short run from ditch to pit, and reopening the pipe. Sufficient drop is given the pipe to insure thorough flushing action as the mud is carried across the pit.

Guard Protects Slush-Pump Drive Belt

Protection of the V-belt on a power-driven slush pump is secured by making a guard from light tank steel which covers the entire top half of the drive, being brought down on the sides to further protect against the possibility of falling objects striking or becoming entangled with the belts. The lower half of the drive is safeguarded against accidental contact by a series of horizontal rods, spaced closely enough to prevent accident, yet allowing quick inspection of the belt condition. Ends of the guard frame, prolonged, rest within sockets carried on the pump frame and permit quick removal of the guard to work on the drive.



Elevated Steam Lines Eliminate Danger

The heated steam lines from boiler domes to the feed-pump stand usually lie along the ground, providing a spot for accelerated condensation, and also creating a hazard by their position so close to the working space around the boilers. One drilling contractor carries the steam lines overhead from boiler to drops at the feed-water stand, affording slope enough for condensation drainage, but keeping the lines high enough for ample headroom. The customary shutoff valves are also removed from mounting on or alongside the dome to the drop legs at the pumps, enabling a quicker shutoff to be made.

Cetane Number And Chemical Composition

By T. Y. JU, M.Sc.,* and C. E. WOOD, M.Sc.
Department of Oil Engineering and Refining,
University of Birmingham, England

Much research has been done, and is being done, to develop a suitable method for rating fuels used in combustion-ignition engines. Various methods have been developed since 1931, yet none of them have been considered as standard procedure, though certain methods have been employed as tentative tests. A series of experiments has been and is being carried out at the University of Birmingham, England, to determine the cetane number of certain pure hydrocarbons. Some results of these experiments are discussed here. Also included are discussions on combustion of oil in compression-ignition engines, delay period and diesel knock, ignition quality of fuels for combustion-ignition engines, cetene and cetane scales and engine tests.

IN compression-ignition engine operation, the fuel is injected into the cylinder some time before the end of the compression stroke in such a way that it is divided into small particles which enter the compressed-air charge at a high velocity. The ignition of the fuel particles is initiated by the intense heat of the compressed-air charge. The mechanism of the combustion of oils in compression-ignition engines is generally considered as occurring in four more or less distinct periods:[1,2] (*a*) Delay period, (*b*) rapid uncontrolled combustion, (*c*) controlled combustion, and (*d*) after burning.

The delay period is that during which a nucleus of flame is formed. The fuel does not start to ignite until the delay period has elapsed. The delay period occurs after the beginning of injection but before the inflammation has occurred in more than a very localized nucleus. There is practically no rise of pressure. The duration of this phase is determined by many factors in which the chemical nature of the fuel is of prime importance. The combustion-chamber design and the engine operating conditions have marked effect on duration of the delay period.

The delay period consists of two parts: (*a*) Physical delay, this being the period of the development of enough fuel vapor (endothermal part) to initiate the next period; (*b*) chemical delay, this being the period required by the preflame reaction in order to reach flame conditions (exothermal part). The physical and the chemical delays cannot, of course, be entirely separated with regard to time, since considerable overlapping occurs. Still, physical and chemical delays should be considered as two separate phenomena.

The rapid uncontrolled combustion period is that during which inflammation spreads throughout the working fluid. The inflammation continues until a temperature and pressure are attained at which the residue of the charge ignites and burns at the nozzle orifice. There is a rapid rise of pressure in this period. The duration and rate of pressure rise in this period are mainly determined by the extent of the delay period and by the mechanical design of the combustion chamber; degree of turbulence is an important factor.

The period of the controlled combustion is that during which the residue of the fuel injected into the flame-filled combustion chamber burns at the nozzle orifice. This period can be controlled mechanically by the rate of injection and the relative motion of the air and fuel particles. The fuel is burnt at, or near, maximum cylinder pressure as it leaves the nozzle.

The combustion is not finished when fuel injection stops, it continues as long as fuel particles obtain oxygen. This constitutes the fourth period, or after-burning. In this period all fuel, which had not up to this instant obtained oxygen necessary for complete combustion or which had a low burning rate, is burnt. This period should be reduced to a minimum since it lowers the performance of the engine appreciably and the fuel quantity per cycle is increased. Excessive wear of cylinder lining wall may sometimes be ascribed to the after-burning.

Delay Period and Diesel Knock

In operation of compression-ignition engines it is important to consider the phenomenon of rough running which is objectionable, not only for its very annoying noises, but also for its harmful effect on the engine. Rough running is sometimes referred to as combustion shock or diesel knock—a hammerlike blow similar to the knock in a gasoline engine. It causes rapid wear on gears through which the load is transmitted, and damage to connecting rods and main bearings.

The phenomenon of diesel knock is being extensively studied, not however, as systematically as investigations were carried out for the knock in gasoline engines. The position existing about 15 years ago, with regard to gasoline engines and the knock rating of their fuels, prevails now with respect to compression-ignition engines and their fuels. Diesel knock is closely related to the delay period of the combustion cycle. Roughness is not related to the maximum pressure in the cylinder; rapidity of the pressure rise in the second period of the combustion cycle is responsible for this. It is clear that for any injection timing, the pressure reached during the second period will depend upon the duration of the delay period, since with longer delay period the more rapid and higher is the pressure rise, for more fuel will be present in the cylinder before the rate of burning comes under control. Therefore the shorter the delay period, the better will be the engine performance, but it is impossible to eliminate the delay period altogether. There should be a short delay period.

Ignition Quality of Fuels

The knocking property of fuels for compression-ignition engines is generally described as ignition quality. For a given engine this property determines duration of the delay period of the combustion cycle. Therefore, the ignition quality must be considered as one of the most important properties of the fuel, if not the only property determining the adaptability of the fuel. Ignition quality influences the ease of starting, degree of combustion knock, roughness of engine operation and to a smaller extent fuel consumption and exhaust-gas temperature. Excessive delay may permit unburned fuel to reach the cylinder walls, resulting in oil dilution and carbon deposit in ring grooves. The development of high-speed compression-ignition engines in recent years makes the requirement of high-ignition-quality fuels more and more acute.

The lower the ignition temperature of the fuel the shorter is the delay period in the combustion cycle. When the fuel droplet enters the hot high-pressure air in the cylinder, heat is abstracted from the compressed air, raising the temperature of the drop very rapidly. It is supposed[3] that only the surface temperature of the drop is raised and the core is not raised to more than about one-third of the surface temperature by the time burning starts on the surface. The chemical constituents play a very important part. It is probable that only the paraffinic hydrocarbons combine with oxygen to form unstable peroxides and start the ignition, while the aromatic may not ignite in quite the same way. Naphthenic hydrocarbons occupy the intermediate position. Types of hydrocarbons other than paraffinic act as high-ignition-temperature diluents and so increase the delay period.

It has been proved[4] that active oxygen and activated hydrocarbons both influence self-ignition in compression-ignition engines and a low thermal stability of the hydrocarbons is necessary for a high oxidation speed. Those fuels which crack readily have the highest ignition qualities, and those fuels which are thermally more stable have lower ignition qualities. Thus oils which are rich in aromatics such as oils derived from coal tar give serious ignition difficulties in the compression-ignition engine. The recent theory[3] put forward for the self-ignition of fuels in compression-ignition engines is:

". . . the reaction initiating ignition is due either to the initial stages of cracking, followed by a development of heat by the reaction of the free radicals formed with oxygen, or to oxygen reacting with the oil molecules which are in a highly strained state just prior to breaking down and so becoming abnormally sensitive to oxygen."

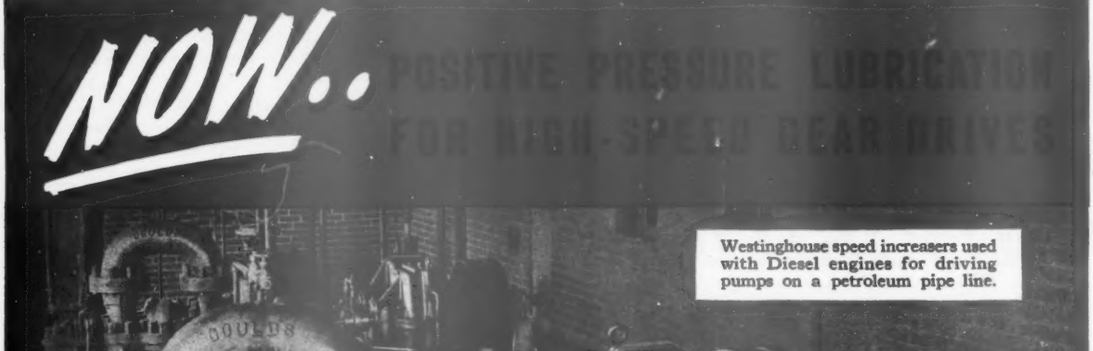
Actual cracking may not take place before oxygen initiates the process.

Cetene and Cetane Scales

Past experience of expressing gasoline knock rating by the octane number (which is the percentage of 2,2,4-trimethyl pentane in a blend of 2,2,4-trimethyl pentane and normal heptane which has the same antiknock tendency as the tested gasoline) has led to the adoption of a similar system of expressing the knock rating of fuels for compression-ignition engines. Blends of a special high-grade gas oil and a coal-tar oil were first recommended for rating fuels, precisely as gasolines are rated in terms of octane-heptane blends.[5] The test fuel is matched with a blend of these two reference oils

*Present address, School of Chemical Engineering, University of Oklahoma, Norman.

NOW.. POSITIVE PRESSURE LUBRICATION FOR HIGH-SPEED GEAR DRIVES



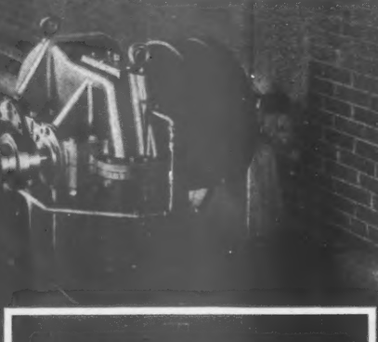
Westinghouse speed increasers used with Diesel engines for driving pumps on a petroleum pipe line.

One of the most important factors in the smooth operation and life of high-speed gear units is proper lubrication. Westinghouse engineers have solved this lubrication problem in Westinghouse Type SU Gear Units by a positive, forced-feed circulating oil system.

The lubricant is supplied under pressure to all moving parts while a spray of oil is directed to the mesh line of the gears. There never is any danger of gears or bearings running dry. All parts are properly lubricated. Wear is held at a minimum and noise reduced.

All parts of lubrication system are externally mounted making them easily accessible. An oil strainer keeps grit and dirt out of the lubricant. A specially designed oil cooler dissipates the heat.

The efficient lubrication system of Type SU Gear Units is only one of the reasons why these speed increasers have been so generally adopted by industry for a wide variety of applications.



Side view diagram of SU Speed Increaser showing forced-feed lubrication system with pump, cooler and strainer externally mounted.

Designed for service with Diesel engines, electric motors, or gas engines, each Type SU Gear Unit is tailor-made to meet individual requirements, thus assuring maximum performance for every installation. It will pay you to get all the details about Westinghouse Type SU Gear Units before you make your next speed increaser installation. Write for booklet DD-3650.

WESTINGHOUSE ELECTRIC & MFG. CO., DEPT. 7-N • EAST PITTSBURGH, PA.

J-07183

Westinghouse Geared Drives

W WESTINGHOUSE ELECTRIC

mixed in such a proportion that its ignition quality is equal to that of the fuel under test. The rating of the fuel is then expressed as the percentage in the blend of one of the reference fuels; namely, that having the higher ignition quality.

Due to difficulties experienced in standardizing the qualities of these two reference oils, blends of pure chemical compounds were later proposed instead of certain fractions of oils with a wide boiling-point range.[5] Cetene and mesitylene were at first suggested, but later α-methyl naphthalene was substituted for mesitylene on the ground of expense. Fuels for compression-ignition engines should be rated in terms of cetene number, that is the percentage of cetene by volume in a mixture of cetene and α-methyl naphthalene which is equivalent in diesel knock rating to the fuel under test. Cetene is a high-quality fuel possessing very low knocking property and α-methyl naphthalene is a poor fuel.

Unfortunately, cetene ($C_{16}H_{32}$, hexadecene-1) can be prepared in the pure state only with difficulty and it is not stable when stored. To overcome this difficulty, cetane ($C_{16}H_{34}$, *n*-hexadecane) is now used instead of cetene. The ignition quality of cetane is little higher than that of cetene, but cetane is stable and easy to prepare pure. Thus more reliable experimental data result when using cetane. Since June 1934, when the A.S.T.M. recommended its use, the cetane scale has become practically universal. The cetane number is determined and expressed in a manner similar to the cetene number; that is, the percentage by volume of cetane in a mixture of cetane and α-methyl naphthalene which the fuel matches in ignition quality when fuel and blend are compared under standard conditions. Thus, by definition, α-methyl naphthalene has a cetane number rating of 0 and cetane of 100.

The relation between cetane and cetene numbers is a straight-line function.[6] The line passes through the origin and a point where the cetane number is 70 and the cetene number is 80. Therefore expressed mathematically:

$$\text{cetane number} = 70/80 \times \text{cetene number}$$

In ordinary routine tests, secondary reference fuels are used rather than the primary standards; these should be carefully calibrated against the primary fuels. Two such secondary fuels have been prepared by the Institute of Petroleum (formerly the Institution of Petroleum Technologists, England), which are designated I.P.T. "high-ignition quality reference fuel" and I.P.T. "low-ignition quality reference fuel" of 70½ and 18 cetane number, respectively. The high-ignition quality secondary fuel consists of a solvent extracted gas oil and the low-ignition quality reference fuel is a cut from the sulfur dioxide extract from Iranian kerosene. Calibration curves which convert blends of these fuels (by volume) to cetene or cetane numbers are linear within the limits required for routine testing.[6]

Engine Tests

The test a priori for suitability of fuels in compression-ignition engines is the engine test itself. Since a widespread interest is being shown in the development of a suitable method for rating fuels for compression-ignition engines there is a commendable restraint as regards standardizing any particular method. Various methods have been developed since 1931, yet none of them has been considered as standard procedure, though certain methods have been employed as tentative tests. Any practical testing method for determining the cetane number of fuels should be convenient, reproducible and representative.

By engine tests, the ignition quality of fuels is not measured as such, but is determined indirectly by comparing the behavior of the fuel in the test engine with certain standard fuels with regard to some special characteristics. Any type of compression-ignition engine should be suitable for fuel testing, but at present the most popular engine is the converted C.F.R. engine, built by the Waukesha Motor Co. The ignition characteristics used for the testing are usually ignition lag, misfire, ease of starting, rate of pressure rise, combustion knock, etc.

Ignition lag can be measured with the proper indicator.[5,7] Ease of starting is determined by running the engine at a constant speed and adjusting the air temperature and the water-jacket temperature to a point low enough to cause a misfire.[7] The audibility of combustion knock can be estimated with the aid of a special instrument known as a strobophonometer, by means of which the noise of a certain phase of the cycle could be measured mechanically.[8]

The throttling method consists in throttling the intake air of a running engine until the engine misfires.[5] The critical compression ratio can be used as an index of the ignition quality.[8] If an engine of a given design is motored under specified conditions then for each fuel there is a certain minimum compression ratio below which the engine will misfire. The lower the C.C.R. (critical compression ratio) the better is the ignition quality of the fuel. In order to eliminate the effect of atmospheric pressure on the value of the C.C.R. some authors prefer the use of critical compression pressure instead of C.C.R.[9] The rate of pressure rise, dp/dt, can be measured with the aid of a cathodic ray oscillograph. The Metrovick-Dodds indicator and the Standard-Sunbury indicator can be used for this purpose.[10]

The ignition quality of fuels for compression-ignition engines can also be determined by measuring the blending octane number of the fuel by testing a blend of the fuel under test with a base gasoline of known octane number in a standard C.F.R. gasoline knock-testing engine.[11] The lower the blending octane number of the fuel the higher will be the ignition quality. The measurement of the H.U.C.R. of the blend in an E-35 Ricardo engine will serve the same purpose.[12]

Among all these indices the ignition lag has been most successfully employed. Until 1933 ignition-lag determinations were all made from indicator diagrams. The concordance in the reproducibility of the indicator method is about 3 cetane numbers. The chief disadvantage of the indicator method is its inconvenience; it is too laborious to be a routine test. The knockmeter-delay method has been used predominantly by the S.A.E. volunteer group for compression-ignition fuel research (now known as the automotive diesel-fuels section of the C.F.R. committee).[13]

The time of injection is shown by the flash of a neon lamp fixed on the flywheel with a suitable connection operated by the opening of the nozzle. The knockmeter is a heavily damped thermocouple-type voltmeter through which direct current is passed. A modified bouncing pin is used which upon bouncing separates two contact points and interrupts the flow of current to the knockmeter. The ignition quality of the test fuel can be compared by observing the reading on the dial of the meter. Instead of using the bouncing pin Socony-Vacuum Oil Co., Inc., has devised a balanced-pressure diaphragm.

The Pennsylvania State method[14] employs a fixed ignition delay of 18°. An electromagnetic unit such as is used in the magnetic type of radio speaker is used. The moment of ignition is determined by a mechanism consisting of a diaphragm in the cylinder wall, a phonograph pickup, a short stiff wire transmitting the motion of the diaphragm to the pickup, a thyratron relay and a neon lamp protractor. The injection timing is kept at 18° crank angle before top center, and ignition is always adjusted to occur at top center exactly by turning the movable compression plug until the neon lamp indicator ignition is at top center. The ignition quality of fuel is shown by the required compression ratio. If the tested fuel has the same R.C.R. as the reference fuel blend, the ignition qualities of both are equal. The speed and accuracy with which the tests are performed are the two prominent advantages of this method.

The present tentative standard methods for the cetane ratings which have been employed by the Institute of Petroleum are designated by I.P.T. F.O. 39T.[9] It has not been found necessary to standardize any particular engine for the determination of ignition quality. Two methods have been recommended, namely:

1. Ignition-lag test—preferred for routine cetane-number determination.

2. Throttling test—readily applicable to a large range of diesel-engine type, therefore convenient for making comparison of fuel ignition qualities where special apparatus is not available.

The committee, D-2 of the A.S.T.M., published a proposed method of test for the ignition quality of diesel fuels in October 1938. Details of the test were first given on September 16, 1938, by the Automotive Diesel Fuel Division (formerly the volunteer group, of the C.F.R. committee)[15] and has been under development for some years by the volunteer group.[16] The method adopted for the measurement is called the "coincident-flash-fixed-delay" method, using neon lights which are located on the periphery of the flywheel, and are operated by contact points on the combustion and injection indicators. Both contact points are of the bouncing-pin type, suitable provision having been made for adjustment of the contact points. In this method, the standard C.F.R. diesel engine is used, the delay angle is predetermined at 13° and the cetane rating obtained by turning the movable compression plug which is adjusted until a coincidence of the injection and combustion neon flashes is obtained.

Evaluation of Pure Hydrocarbons as Compression-Ignition Engine Fuels

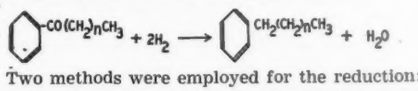
A series of experiments has been and is being carried out in the department of oil engineering and refining at the University of Birmingham, England, to determine the cetane numbers of certain pure hydrocarbons distilling within the diesel-fuel range.[17] The pure hydrocarbons, the cetane numbers of which have been mentioned in the literature before the work was started, were few and are as follows:

Hydrocarbon—	Cetane No.	Cetene No.
Cetene	88	100
Cetane	100	...
α-Methyl naphthalene	0	0
Tetra-isobutylene	4.5	5
Isooctane	...	17
n-Heptane	57	...

The molecular structure of a fuel is the deciding factor of ignition quality. Straight-chain paraffins are least stable thermally and isoparaffins and aromatics are more stable. Naphthenes occupy an intermediate position between these two types. The initial idea in the research was to take a midcourse; that is, to investigate those compounds having properties midway between aromatics and paraffins. Straight-chain paraffins are present in fuels for compression-ignition engines, but the proportion must be small due to the low pour-point requirement of the fuel. Although there is little work on the isolation of individual hydrocarbons present in the diesel-oil fractions of crude petroleum, it is possible that alkylated benzenes with a long side chain are present in fuels of high ignition quality. Thus, normal monoalkylated benzenes were considered as being most suited for investigation. The cetane numbers of a number of hydrocarbons derived from benzene by increasing the length of the paraffinic side chain were determined. The series included *n*-amyl ben-

zene up to *n*-tetradecyl benzene. All the hydrocarbons investigated came within the distillation range of fuels for combustion-ignition engines. The aromatic influence of the phenyl group is diminished gradually on ascent of the series.

The hydrocarbons were prepared by reducing the corresponding alkyl aryl-ketones:



Two methods were employed for the reduction: (1) Clemmensen's method of reduction by means of zinc amalgam and hydrochloric acid; (2) catalytic hydrogenation of the ketone in alcoholic solution under a pressure slightly greater than atmospheric, in the presence of palladium deposited on animal charcoal.

Table 1 briefly summarizes the physical properties of the alkylbenzenes.

In rating these compounds, two reference fuels, the I.P.T. high ignition-quality and low ignition-quality secondary reference fuels, were used to match the sample. The high-standard fuel has a cetane number of 70.5 and the low standard a cetane number of 18. Fuels of any cetane number between 70.5 and 18 can be matched by mixing these two reference fuels. In the case of *n*-tetradecyl benzene, the cetane number was higher than that of the high-standard reference fuel, so a blend of primary reference fuels of cetane and *a*-methyl naphthalene was used in matching the cetane number of the sample.

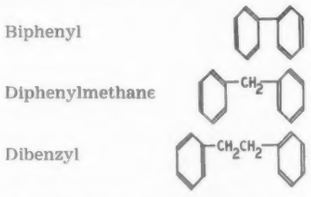
The cetane numbers and blending cetane numbers calculated from 50-50 blends with the secondary reference fuels are shown in Table 2. The blending cetane numbers of benzene and toluene are included for comparison purposes.

From Table 2 it will be clear how the length of the side chain can affect the properties of an aromatic hydrocarbon. As expected, the cetane number of *n*-alkyl benzenes increases by increasing the number of carbon atoms in the side chain owing to diminution of aromatic simultaneously with increase of paraffinic character. From the cetane numbers of alkylbenzenes, it is clear that amyl benzene has properties predominantly aromatic, that is to say five carbon atoms in the chain are not sufficient to overwhelm or to balance the inherent aromatic character of the benzene nucleus. When the number of carbon atoms in the chain and in the nucleus are equal, i.e., *n*-hexyl benzene, the properties are midway between aromatic and paraffinic.

It would be anticipated that the rate of increase of cetane number with respect to increasing chain length diminishes as the series ascends. Increase of one carbon atom in the chain from amyl to hexyl causes an increase of cetane number from 8 to 26, and from hexyl to heptyl, from 26 to 35, while increase of two carbon atoms in the chain from dodecyl to tetradecyl causes an increase of only 4 cetane numbers, namely, from 68 to 72.

It is usually assumed[5] that cetane numbers when expressed in weight instead of percentage by volume were additive, so for fuel blends the cetane numbers indicated a linear relationship. From the graph of cetane numbers against percentage by weight of reference fuel, the cetane number of the unblended pure hydrocarbon can be read off by extrapolation. According to this assumption, the blending cetane number of hydrocarbons for any blend with the reference fuel should be equal to the unblended cetane number of the sample. Considering Table 2, this assumption only applies to higher members, the curvature of the blending curves becoming greater the lower the molecular weight of the hydrocarbon. In all cases, except *n*-dodecyl and *n*-tetradecyl benzenes, the actual cetane numbers obtained by running the hydrocarbon straight in the engine were lower than those calculated by extrapolation. The lower the molecular weight the greater is the error in the determination of the cetane numbers by extrapolation (assuming a linear relationship)—the error being on the positive side. And for *n*-dodecyl and *n*-tetradecyl benzenes, linear relationships were obtained.

The second part of the investigation deals with biphenyl and its homologues, namely:



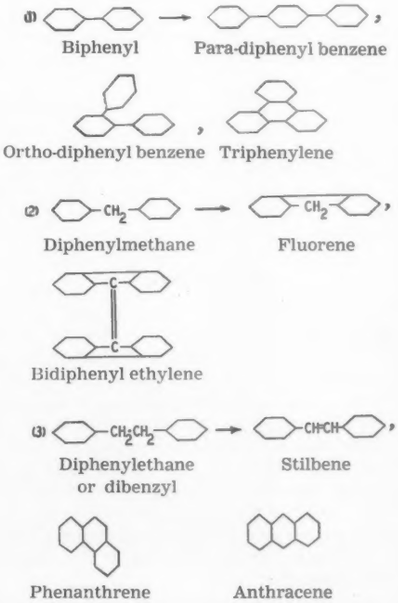
Since these three compounds are solid under ordinary conditions, the engine tests could only be performed by dissolving the pure hydrocarbons in high ignition-quality secondary reference fuel (cetane number 70.5) and determining the cetane numbers of the blends. Still, the boiling points of the three hydrocarbons all come within the distillation range of diesel-fuel fractions. The low solubility of biphenyl in the secondary reference fuel prevents the testing of high concentration blends. There appears to be a tendency for curvature of all the three blending curves, which makes it difficult to deduce what is the cetane number of the unblended hydrocarbon within reasonable experimental error. The engine test was performed according to the procedure and operating conditions specified in the proposed A.S.T.M. method.[15] The following blending cetane numbers were calculated from the curves either by interpolation (*) or by extrapolation (†).

Hydrocarbon—	Blending cetane numbers From 25% blend	From 50% blend
Biphenyl	†47	†21
Diphenylmethane	*43	*11
Dibenzyl	*39	†1

The results of the three biphenyl homologues show that biphenyl possesses the highest cetane number. It is important to note that the cetane value of biphenyl is entirely of aromatic origin. It is a paradox that the more aromatic compound (biphenyl) here possesses a higher blending cetane number than dibenzyl which is less aromatic in structure. This is related to many factors such as the reversible or oscillatory electromeric changes of aromatic rings, also thermal stability, mechanism of combustion, etc. It is well known that the two phenyl rings in biphenyl are extended along an axis and are not folded over; further the rings are coaxial, coplanar, and have free rotation; that is, they are not restrained from rotational movement as is the case in certain orthosubstituted biphenyls.

It has been shown by X-ray analysis that the two rings of dibenzyl are situated in an end-on position. So there is no reason to assume that in the three diphenyl homologues there is any fundamental difference in stereochemical configuration. Still, the electronic relationship of the two phenyl groups (at the junction of the two phenyl nuclei) may be different from those possessed by diphenylmethane and bibenzyl (at the junction of the phenyl nucleus and the methylene group). This mode of union may in part account for the products which have been identified in the pyrolysis of the three aromatic hydrocarbons.

The mechanism of pyrolysis in each case gives rise to the following hydrocarbon products:



Referring to biphenyl, in order that the two primary pyrolytic products be formed, biphenyl has undergone scission with separation of the phenyl radical which then reacts with a mole-

TABLE 1—SUMMARY OF PHYSICAL PROPERTIES OF THE ALKYLBENZENES

Hydrocarbon—	Boiling point, °C. 9 mm.	760 mm.	Viscosity, cs. 100°F.	210°F.	Sp. gr. 60/60°F.
n-Amyl benzene	77-8	204-5	1.226	0.661	0.8662
n-Hexyl benzene	93-4	226-7	1.465	0.753	0.8646
n-Heptyl benzene	108-9	240-1	1.785	0.863	0.8637
n-Nonyl benzene	137½-8½	280-1	2.450	1.106	0.8626
n-Dodecyl benzene	172-3	....	4.210	1.566	0.8607
n-Tetradecyl benzene	195-6	....	5.610	1.958	0.8605

TABLE 2—CETANE NUMBERS AND BLENDING CETANE NUMBERS OF ALKYLBENZENES

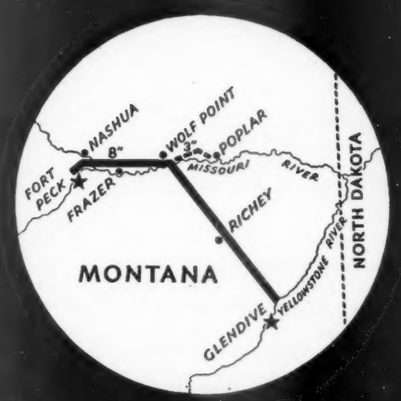
Hydrocarbon—	Cetane No.	Blending Cetane No. from 50/50 blends: With high ref. fuel of cetane No. 70½	With low ref. fuel of cetane No. 18	Difference, blending-exp. Cetane No.
1. Benzene†	..	—10	..	..
2. Toluene†	..	—21	..	..
3. *n*-Amyl benzene*	‡8	18	..	10
4. *n*-Hexyl benzene*	26	32	..	6
5. *n*-Heptyl benzene*	35	39	..	4
6. *n*-Nonyl benzene*	50	51	..	1
7. *n*-Dodecyl benzene†	68	..	68	0
8. *n*-Tetradecyl benzene†	72	..	72	0

*Hydrocarbons 3, 4, 5, and 6 were rated by Schweitzer and Hetzel's fixed-ignition-delay method (the Pennsylvania State method)[15] in a C.F.R. diesel unit with the following operating standardized conditions: (*a*) Engine speed, 900 r.p.m.; (*b*) jacket-water temperature, 210° F.; (*c*) air-inlet temperature, 140° F.; (*d*) lube-oil temperature, 110° F.; (*e*) injection pressure (valve-opening pressure), 1,500 lb./sq. in.; (*f*) fuel quantity, 13 c.c. per minute; (*g*) injection advance angle, 13°; (*h*) compression ratio varied until ignition registers at top dead center as indicated by the neon-lamp flash, i.e., delay angle fixed at 13°.

†Hydrocarbons 1, 2, 7, and 8 were rated by the A.S.T.M. coincident-flash-fixed-delay method.[15] Same operating conditions as specified in the proposed method have been employed.

‡The cetane number of *n*-amyl benzene is too low to be run straight in the engine. The extrapolated value from the blending curve shows that the cetane number of this hydrocarbon is equal to 8.

AGAIN, DRESSER COUPLINGS FOR GAS-LINE MILEAGE TOTALING 117!



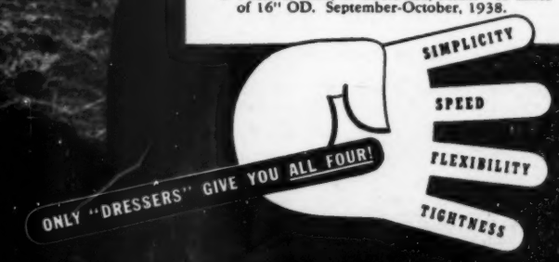
To serve additional Montana towns with natural gas, the 117-mile, 8⅝" OD, Fort Peck-Glendive transmission line taps the Bowdoin gas field and connects at the other end with the main pipe-line system of Montana-Dakota Utilities Company.

Dresser joints are used on *this* line for the same "ALL-FOUR" reasons that have resulted in their choice on many other modern lines, namely:

Simplicity—"Dressers" are installed by unskilled labor. *Speed*—on this line, an average of 2 miles of line per 10-hour day coupled with "Dressers." *Flexibility*—"Dressers" absorb expansion and contraction; render these forces harmless. *Tightness*—"Dressers" easily maintain full test pressure (here, 300 pounds for 24 hours, with only 1-pound drop allowable). DRESSER MANUFACTURING COMPANY, BRADFORD, PENNSYLVANIA.

THESE IMPORTANT GAS-TRANSMISSION LINES, TOO, ARE DRESSER-COUPLED!

1. *Liberal, Kans., to Springfield, Ill.*—9 loops totaling 137 miles—79 miles of 24" OD, 54 miles of 22" OD, and 4 miles of 18" OD. Begun December, 1939.
2. *Onward, Miss., to Yazoo City, Miss.*—32 miles of 18" OD. October-November, 1939.
3. *Montezuma, Ind., to Zionsville, Ind.*—70 miles of 24" OD. June-July, 1939 and July, 1940.
4. *Ventura, Iowa, to Albert Lea, Minn.*—40 miles of 16" OD. September-October, 1938.



cule of biphenyl either in the ortho or para position, with elimination of hydrogen. The formation of fluorene involves the loss of hydrogen in positions ortho to the $-CH_2-$ group in each ring, and formation of a new five-carbon ring. This ring system may condense to bidiphenylethylene. The oxidation of diphenylmethane under certain conditions proceeds to benzoquinone and the oxidation of fluorene to fluorenone,

In the pyrolytic mechanism of dibenzyl, loss of hydrogen from the chain occurs with formation of stilbene. This hydrocarbon may undergo the following two changes: (*a*) loss of hydrogen from each ring in the ortho position, then condensation resulting in the formation of phenanthrene, (*b*) scission of stilbene giving the reactive grouping, $C_6H_5-CH=$, thus an explanation of the occurrence of the pyrolytic product anthracene,

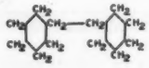
is clear.

In the catalytic oxidation of toluene to benzoic acid anthraquinone is a byproduct. The compound must have its origin either in the benzyl radical, $C_6H_5-CH_2-$ (derived from toluene), or in the phenyl carbonyl radical, C_6H_5-CO- (derived from benzoic acid). The reactive character of the benzyl groups is well known and its scission from dibenzyl may account for the pyrolytic product, anthracene.

It should be mentioned that phenanthrene is very susceptible to oxidation and anthracene even more so.

Thus under the cracking-oxidation conditions prevailing in the combustion chamber the three hydrocarbons may undergo different changes. Diphenylmethane and dibenzyl have a greater tendency to form condensed nuclei (fluorene, phenanthrene, etc.) when compared with biphenyl. This would account for the relative lowering of the cetane number in proceeding from biphenyl to dibenzyl. A point which is based on the probability that aromatic compounds of condensed ring systems of aromatic character lower the cetane number.

In addition to the abovementioned hydrocarbons the cetane numbers of bicyclohexyl,



and *m*-diisopropyl benzene,

were determined for comparison purposes.

The following table summarizes the principal physical properties of the two hydrocarbons:

	Boiling point, °C.		Viscosity, c.s.		
Hydrocarbon—	9 mm.	760 mm.	100°F.	210°F.	Sp. gr. 60/60°F.
Bicyclohexyl	95-6	238.5	3.057	1.235	0.8906
m-Diisopropyl benzene	75-6	204	1.250	0.644	0.8638

The rating was performed by the A.S.T.M. proposed method.[15] *m*-Diisopropyl benzene could not be run straight in the engine owing to its low cetane number. The results of the engine tests are given below:

Hydrocarbon—	Cetane No.	Blending cetane number, 50-50 blend with high reference fuel
Bicyclohexyl	53	53
m-Diisopropyl benzene	*—12	—3

*Extrapolated.

From these results, it is clear that the molecular percentages of hydrogen affect the cetane number of the hydrocarbon to a considerable extent. Bicyclohexyl possesses far better ignition quality than biphenyl as shown by cetane-number determinations. Further, the position and nature of the substituent side chains of the nucleus are also important factors in affecting the cetane numbers of substituted benzenes. Although *n*-hexyl benzene and *m*-diisopropyl benzene are isomeric, yet their cetane numbers are widely different. *n*-Hexyl benzene has a cetane number of 26 and blending cetane number of 32, while *m*-diisopropyl benzene has —12 and —3, respectively.

Owing to the fact that the melting point of normal paraffin hydrocarbons which distill within the diesel-fuel range is generally high, the evaluation of the ignition quality of naphthenic hydrocarbons would be of much interest and importance.

Acknowledgement

The authors wish to express their gratitude to Prof. A. W. Nash, head of the department of oil engineering and refining, Birmingham University, England, for his continued interest in this research.

References

1. Ricardo, H. R., Automobile Engineer (London), 1930, 20, 151.
2. Boerlage, G. D., and Broeze, J. J., Ind. Eng. Chem., 1936, 28, 1229; Chem. Rev., 1938, 22, 61; Sc. of Petroleum, 4, 2894.
3. Le Mesurier, L. J., and Stansfield, R. Paper read before the NE. Coast Inst. of Engineers and Shipbuilders in Newcastle-upon-Tyne on 26th Feb., 1932.
4. Boerlage, G. D., and Van Dyck, W. J. D., Engineering, 1934, 137, 335; J. Roy. Aero Soc., 1934, 38, 953; J. Inst. Aut. Eng., 1934, 2 (7), 11; J. Inst. Pet. Tech., 1935, 21, 40.
5. Boerlage, G. D., and Broeze, J. J., Engineering, 1931, 132, 603, 687, 755; J. Soc. Aut. Eng., 1932, 31, 283, 338.
6. Anon., J. Inst. Pet. Tech., 1938, 24, 170.
7. Le Mesurier, L. J., and Stansfield, R., J. Inst. Pet. Tech., 1931, 17, 387.
8. Pope, A. W., and Murdock, J. A., J. Soc. Aut. Eng., 1932, 30, 136.
9. MacGregor, J. R., J. Soc. Aut. Eng., 1936, 38, 217.
10. Beale, E. S. L., and Stansfield, R., Engineer, 1935, 160, 617; Dodds, E. M., J. Soc. Aut. Eng., 1936, 39, 487; Dodds, E. M., and Sprake, C. H., Engineering, 1935, 149, 183.
11. Dumanois, P., Compt. Rend., 1933, 196, 1003; Ann. des. Comb. Lig., 1933, 8, 490.
12. Glaister, E., Engineering, 1937, 144, 139, 195.
13. Rendel, T. B., Penn. State College School of Eng. Tech. Bull., No. 20, 1934, p. 93.
14. Schweitzer, P. H., and Hetzel, T. B., The Oil and Gas Journal, 1936, 34 (36), 36; J. Soc. Aut. Eng., 1936, 38, 206; Aut. Ind., 1935, 73, 202.
15. Anon., J. Soc. Auto. Eng., 1938, 43, 453.
16. Baxley, C. H., and Rendel, T. B., J. Soc. Aut. Eng., 1938, 42, 27; Rendel, T. B., J. Soc. Aut. Eng., 1935, 36, 206; idid., 1936, 38, 225.
17. Shen, G., Wood, C. E., and Garner, F. H., J. Inst. Pet., 1939, 25, 659. Shen, G. J. T., Thesis, Birmingham University, 1939. Ju, T. Y., Thesis, Birmingham University, 1940.

SAFETY — Longer Rathole Pipe Raises Drive Bushing

IN the early days of rotary drilling, the kelly joint and swivel were stood back the same as the drill pipe. This was very dangerous as the kelly would sometimes get beyond the control of the derrick man; in other cases the C-link connecting the swivel bail and the becket of the traveling block would fail. All of this danger was eliminated with the introduction of the rathole.

Many rotary rigs now use kelly-drive bushings which stay on the kelly from the time the hole is started until it is completed. When the kelly is set back in the rathole, the bushing is above the floor level and has four sharp corners. The kelly-drive bushing rests on the top of the rathole and this height varies on different rigs. In many cases the drive bushing is just high enough to jab a man in the ribs and in others it is just right for a man to hit it with his head. Walking into an object or hitting it with some part of the body sounds rather ridiculous but the roughnecks, concentrating on the tasks at hand, occasionally do that with quite painful results.

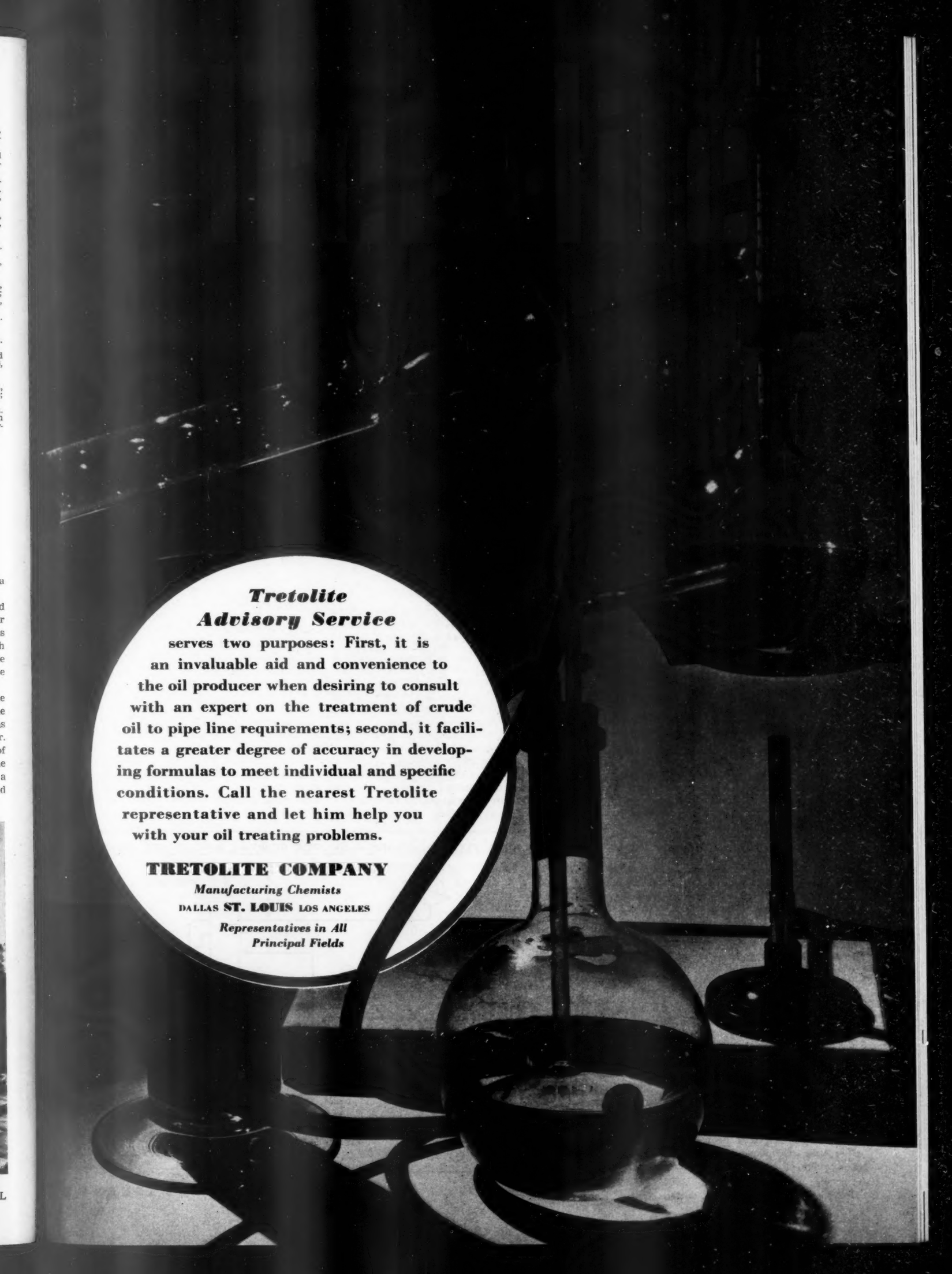
In addition to the drive bushing providing a hazard, the ordinary rathole also allows the kelly to be bent by the weight of the swivel. This is due to the rathole's sloping so the swivel leans toward the derrick floor.

As soon as the kelly becomes bent, it assumes an eccentric motion at high rates of rotation and serious damage to the drill pipe, surface casing, swivel bearings, and rotary table may result. The kelly may get so bad that it may have to be straightened, an item of some expense.

One drilling contractor uses the method shown in the accompanying photograph to keep the kelly straight and at the same time keep the drive bushing far enough overhead to prevent its being a hazard. Instead of the kelly resting on the bottom of the rathole, it hangs on the drive bushing and swivel. Little damage will be done to a man walking into the smooth round pipe.

The same amount of rathole must be drilled as the kelly almost touches bottom but a longer rathole pipe is used. How much longer depends on the size and type of the swivel and the length of the swivel bail. The only objection to the high rathole is a little difficulty in stabbing the kelly into it.

The rathole pipe remains full of water and the floor around it would become muddy each time the kelly was run in the rathole if provision was not made for the water to escape under the floor. The overflow holes can be seen on the side of the rathole pipe just below the floor level. The holes are also used for pulling the rathole, a piston rod being inserted through the holes and a set of elevator bails.


Tretolite
Advisory Service
serves two purposes: First, it is an invaluable aid and convenience to the oil producer when desiring to consult with an expert on the treatment of crude oil to pipe line requirements; second, it facilitates a greater degree of accuracy in developing formulas to meet individual and specific conditions. Call the nearest Tretolite representative and let him help you with your oil treating problems.
TRETOLITE COMPANY
Manufacturing Chemists
DALLAS ST. LOUIS LOS ANGELES
Representatives in All Principal Fields

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

Melting Point of Gas Hydrates

We would like your opinion regarding the temperature at which we should expect the information of gas hydrates under an operating pressure of 355 lb. absolute when the outlet gas has the following analysis: Methane, 93.3 per cent; ethane, 4.7; propane, 1.2; isobutane plus, 0.8. We should also appreciate knowing the effect of reducing the isobutane content to 0.07 per cent?—D. E. F.

Not much experimental data on the relation of gas composition to the melting point of the hydrates that are formed, are available. However, the original paper of E. G. Hammerschmidt in Ind. Eng. Chem. Vol. 26, Page 851, 1934, indicates that the melting points of the various hydrates is little affected by composition. The effect of pressure, however, is very pronounced.

The following tabulation of the melting points from Hammerschmidt of several hydrates does not indicate that composition has much effect:

	Per cent		
Gas composition—	Natural gas (average)	Propane	Isobutane
Carbon dioxide	0.10	....	....
Nitrogen	6.15	....	....
Methane	82.60	....	....
Ethane	6.33	Trace	....
Propane	3.86	100.0	....
Isobutane	0.35	Nil	100.0
n-Butane	0.53	....	....
Pentanes plus	0.08	....	....
Melting point of hydrate—	°F.		
At 150 lb./sq. in. abs.	36.8	....	....
At 405 lb./sq. in. abs.	49.2	50.0	....
At 620 lb./sq. in. abs.	55.5	54.5	53.3
At 833 lb./sq. in. abs.	60.0	....	58.0

The analysis of the hydrate formed from the natural gas indicated that the heavier hydrates, i.e., propane and isobutane, were formed in larger amounts than the methane and ethane hydrates.

From the above it appears that a change in composition from 1 to 100 per cent of isobutane plus will change the melting point by only a few degrees. It also appears that hydrate formation would take place at 45°-50° F. at a pressure of 355 lb. for the gas which you will handle.

Why Compounded Oils?

We would like some information in regard to cylinder oils. Why are cylinder oils compounded with fatty oils? Where and when are compounded oils to be used over noncompounded oils?—L. G. R.

Fatty oils have three general beneficial (for some situations) effects. They reduce the coefficient of friction, they cause an oil to wet metals when in the presence of hot water, and some of the compounding oils will cause the formation of a relatively stable oil-water emulsion.

They are used rarely today for the purpose of reducing the coefficient of friction because of the possible deleterious secondary effects, such as the formation of oxidation products, and the formation of free fatty acids which corrode metals.

In steam-engine lubrication, compounded oils are preferred for cylinders operating on saturated steam or when condensation of steam takes place, or for slow-speed engines. Superheated-steam cylinders need less (or no) compounding agent and if the condensate is to be used again as boiler-feed water, compounded oils are not used. The percentage of compounding agent, according to Lockhart, "American Lubrication," the Chemical Publishing Co., New York (1927), ranges from 2 to 12 per cent, the low value being for high-temperature cylinders and the higher percentage for cylinders in which condensation of water occurs. About the only common examples are compounded cylinder oils and marine engine oils.

The formation of a mechanical oil-water mixture (so-called emulsion) is seldom an advantage. However, in certain situations of underwater lubrication on dredges and the like, in some cylinder-oil situations, and particularly for certain metal-tool-cutting oils, the formation of an emulsion is a desirable property. Several of the federal specifications call for minimum emulsion numbers, and occasionally it is recommended that fatty oils be added to compounded oils that contain blown rape-seed oil in order to add to the quality of emulsibility (Lockhart).

Simplified Flow Diagrams

Removal of Sulfide From Natural Gas

We are confused about the merits of the several processes for removing sulfide from gas. Can you outline these processes for us in a general way?—C. A. M.

Except for the old iron oxide (dry) process of removing hydrogen sulfide the processes now most widely employed are all very similar to one another in general fundamental features. They all involve the recirculation of a liquid absorption solution for removal of sulfide from the gas, usually followed by a revivification of the spent solution by boiling or by oxidation or stripping with air. Heat exchangers are used to save steam.

There are, in general, three types of processes of which the recirculation scrubbing processes just referred to are the most useful. These are:

1. Iron oxide (dry) process: The cost of labor for removing the spent oxide is now prohibitive.

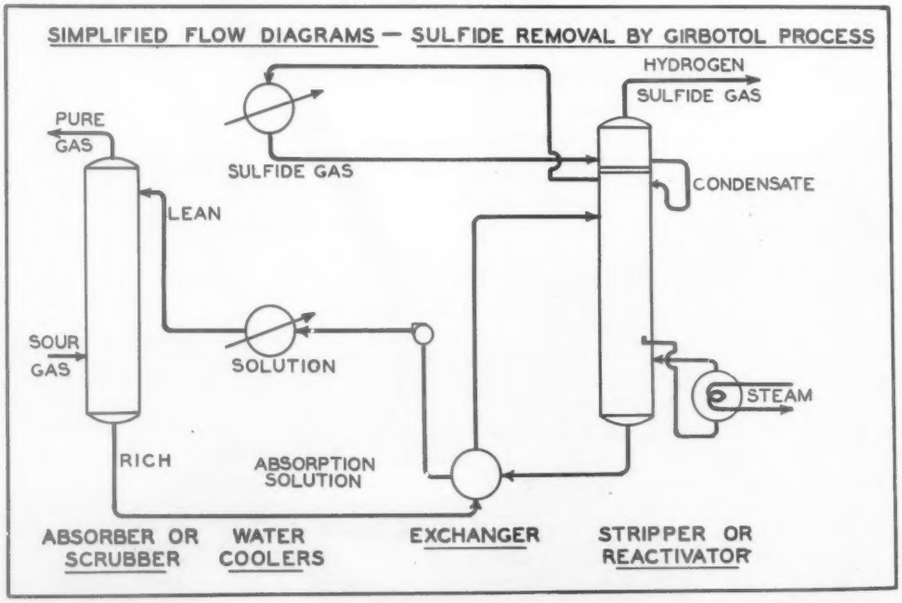
2. Free-sulfur processes: In these, solutions of iron, nickel and arsenic salts or tripotassium phosphate (with zinc or iron catalyst) are used to absorb the sulfide and the solution is regenerated by air blowing, or by air already contained in the gas. A froth of free sulfur can be skimmed from the solution. Solid sulfur tends to be deposited in various parts of the equipment.

3. Recirculation scrubbing processes: The most common processes are as follows:

Process—	Chemical solution	Regeneration
Lime slurry	Calcium or magnesium hydroxide	Air or discarded
Seaboard	Sodium or potassium carbonate	Air or boiling
Shell phosphate	Tripotassium phosphate	Boiling
Girbotol	Mono, di, or triethanolamine and diaminopropanol	Boiling
Alkacid	Aminosulfoacids or aminocarbonic acids	Boiling
Phenolate	Sodium phenolate	Boiling

Solutions of sodium arsenate (Thylox processes) and potassium borate has also been proposed. A reboiler rather than process steam is usually employed for heating because the condensate from the steam tends to dilute the solution.

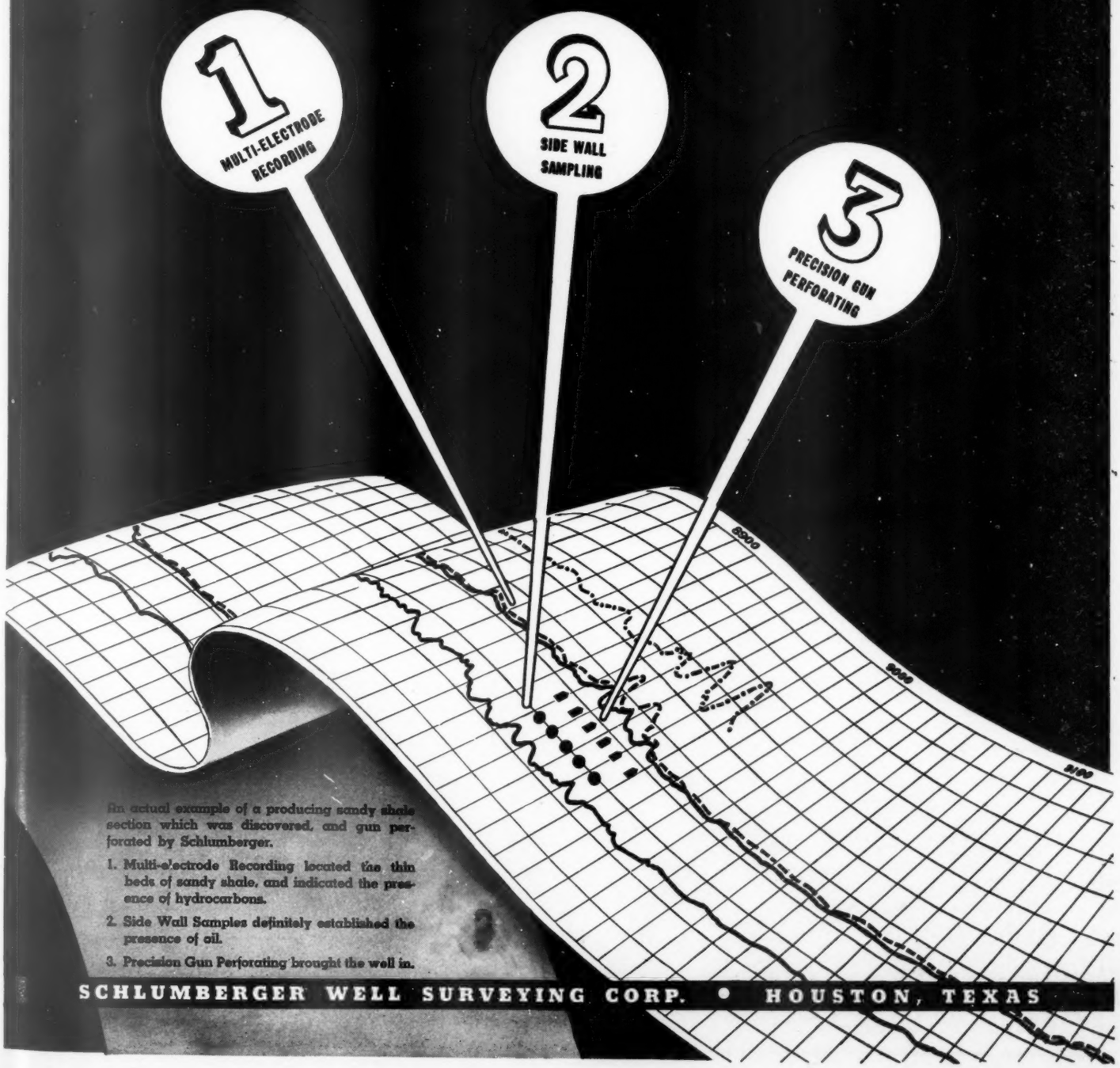
The recirculation scrubbing processes are illustrated by the flow diagram of the Girbotol process which is shown in this page. The selection of a process depends upon the effectiveness of the solution as an absorbent; and the cost, stability, and corrosiveness of the chemical solution. The absorption efficiency governs the amount of solution that must be recirculated and thus indirectly, the amount of heating or air blowing that must be conducted. If the chemical is stable to such an extent that little or no loss occurs except by leaks or entrainment, the cost of the chemical, unless it is an extremely expensive material, becomes of little significance. The processes differ from one another in these economic considerations and can only be judged by a careful study of each process.



For Greater Precision and Economy

SCHLUMBERGER

Offers These Three Companion Services



An actual example of a producing sandy shale section which was discovered, and gun perforated by Schlumberger.

1. Multi-electrode Recording located the thin beds of sandy shale, and indicated the presence of hydrocarbons.
2. Side Wall Samples definitely established the presence of oil.
3. Precision Gun Perforating brought the well in.

SCHLUMBERGER WELL SURVEYING CORP. • HOUSTON, TEXAS

WELL LOGS and FIELD DATA . . . . of Active Oil Areas

Central San Joaquin Valley

(Compiled by The Oil and Gas Journal)

LOCATION: The San Joaquin Valley of California west of a line from Fresno to Bakersfield.

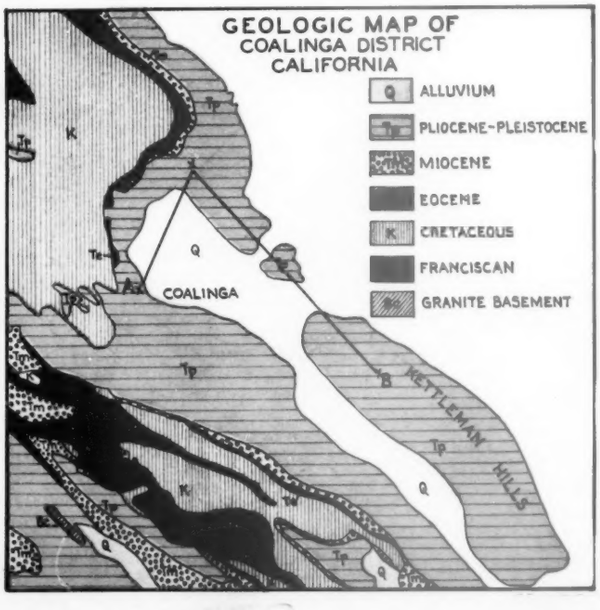
COMMUNICATIONS: The central part of the San Joaquin Valley is traversed by two lines of the Santa Fe and one line of the Southern Pacific. Branches serve the oil-field area to the west.

A network of paved roads covers the central part of the valley and thins out in the more sparsely settled area to the west.

The larger towns have airports.

DEVELOPMENT: The district has long been productive as the Coalinga field was opened up in 1896. As more is learned of the geology and as better drilling equipment is provided, development is carried out into the valley where productive horizons are found below 13,000 ft. That this deeper drilling promises rich returns is indicated by the fact that during the past 3 years two fields have been opened up in the Coalinga district and Wasco has been found far out in the valley.

The fields of the western part of the San Joaquin Valley were first found in the foothills belt along the eastern border of the Coast ranges. These included Coalinga in the district under review and McKittrick and Midway Sunset farther to the south. The last-named field was the country's largest producer until first place was taken by the East Texas field. The older Coalinga fields have produced over 350,000,000 bbl. of oil. The existence of these prolific fields encouraged prospecting farther out in the basin and gradually the picture is developing of a number of trends which project out from the basin rim and curve to the east, roughly paralleling the mountain ranges at the south end. Coalinga, Kettleman Hills, and Lost Hills lie on one of these curved trends which may also include the Buttonwillow gas field. The earlier-discovered fields in these trends produced from the Etchegoin (Pliocene) and the fact that the text-book structure at Kettleman Hills was not productive did much to discourage prospecting in the basin. However, in 1932 the Temblor (Miocene) was found productive in Kettleman North Dome and later the Avenal (Eocene) was opened up. This resulted in the drilling of the world's deepest well at Wasco to the Eocene. Although this well did not produce in the Eocene, it was plugged back to the Vedder zone in the Pliocene and completed as a producer. Farther to the south the Stevens and Rio Bravo zones (Miocene) have also been proved to be rich producers.



GEOLOGY: The San Joaquin Valley forms a fore-deep in front of the highly folded California Coast Ranges lying east of the San Andreas fault. During the early Tertiary this fore-deep lay below sea level and was gradually filled with sediments both from the Coast Range and from the highlands to the east. The latter rose during the later Tertiary to form the Sierra Nevada and contributed much more sediment to the valley which by this time had been elevated and was above sea level much of the time. Consequently the section passes upwards from one which is dominantly marine to one which is part marine and part continental and eventually one which is entirely continental. The continental deposits, of course, are nonproductive and also mask many of the underlying structures.

During the frequent movements which accompanied the mountain building on both flanks of the valley, the secondary folds were set up in the valley sediments. These result in the formation of elongated anticlines such as that at Kettleman Hills where the outcropping Pliocene sediments form one of the most perfect anticlines known. Farther out in the valley, the structures become smaller and less regular.

The frequent movements, resulting in local uplifts, have developed unconformities at many levels in the section and frequently raised structures above sea level. The shore lines around these local uplifts received marine sediments and consequently form excellent loci for oil accumulation.

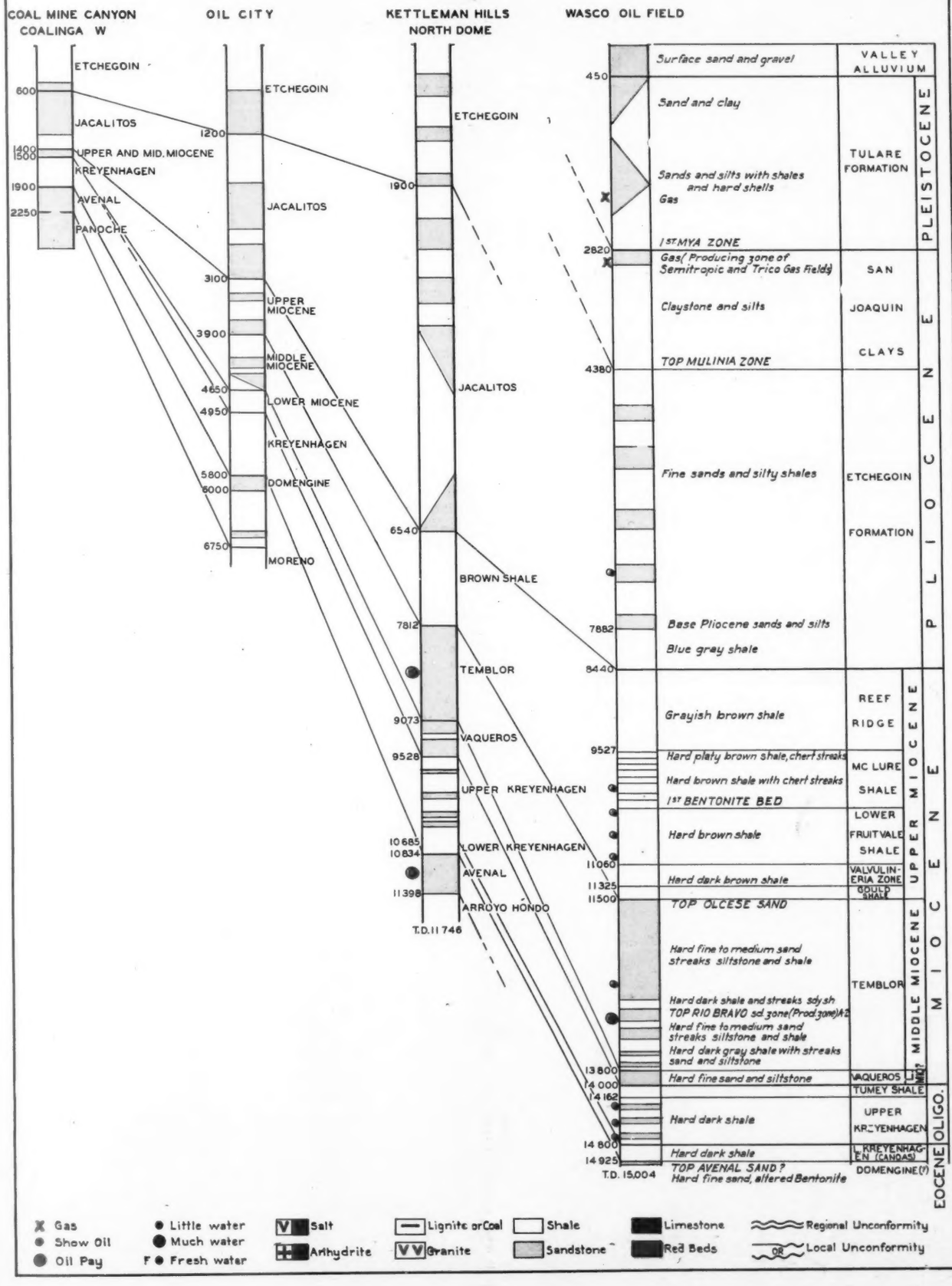
POSSIBILITIES: The results of drilling in the San Joaquin Valley have indicated that few generalizations can be made which definitely discount the possibilities of any given region. Correlations within individual formations have not been carried out in great detail because of the occurrence of zones which pinch out towards the old shore lines. Consequently new productive zones may be picked up on structures which have not proved productive either toward the margin or deeper in the basin.

The fact that new fields have not been discovered in sufficient quantity during the past few years to maintain reserves is not an indication that the possibilities are becoming exhausted nearly so much as the fact that new methods must be developed for finding new reserves. Chief among these is a greater degree of cooperation among operators in the interchange of information already obtained. Where, in other states, logs are freely circulated and operating companies permit the publication of data regarding correlation, this information is very difficult to obtain regarding the San Joaquin Valley.

Mention has already been made of the different trends in the region. Wasco is not on any structural trend yet established, although the subparallelism of the other structural trends in the region leads to the speculation that other fields will be found to the northwest and southeast of Wasco.

Estimated ultimate production per acre for various fields in this area are: Coalinga (old fields), 27,000 bbl.; Coalinga (northeast and southeast), 50,000 bbl.; Kettleman Hills, 56,000 bbl.; Lost Hills, 42,000 bbl.; Wasco 11,000 bbl.

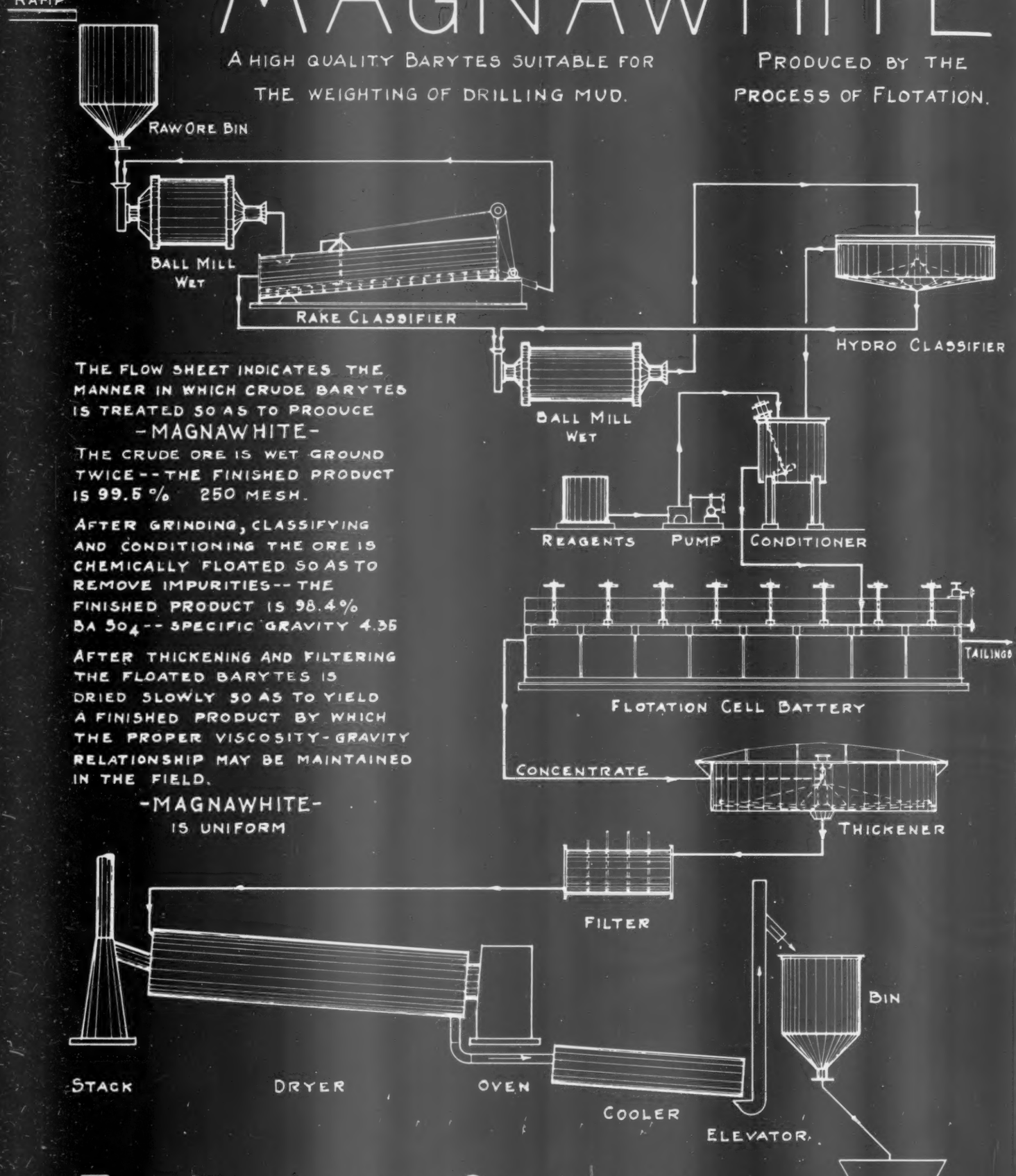
GENERALIZED COLUMNAR SECTIONS OF COALINGA DISTRICT CALIFORNIA



MAGNAWHITE

A HIGH QUALITY BARYTES SUITABLE FOR THE WEIGHTING OF DRILLING MUD.

PRODUCED BY THE PROCESS OF FLOTATION.



THE FLOW SHEET INDICATES THE MANNER IN WHICH CRUDE BARYTES IS TREATED SO AS TO PRODUCE

-MAGNAWHITE-

THE CRUDE ORE IS WET GROUND TWICE -- THE FINISHED PRODUCT IS 99.5 % 250 MESH.

AFTER GRINDING, CLASSIFYING AND CONDITIONING THE ORE IS CHEMICALLY FLOATED SO AS TO REMOVE IMPURITIES -- THE FINISHED PRODUCT IS 98.4% $BaSO_4$ -- SPECIFIC GRAVITY 4.35

AFTER THICKENING AND FILTERING THE FLOATED BARYTES IS DRIED SLOWLY SO AS TO YIELD A FINISHED PRODUCT BY WHICH THE PROPER VISCOSITY-GRAVITY RELATIONSHIP MAY BE MAINTAINED IN THE FIELD.

-MAGNAWHITE-

IS UNIFORM

THE MILWHITE COMPANY, INC.

5800 LYONS AVENUE
HOUSTON, TEXAS

501 FIFTH AVENUE
NEW YORK, N.Y.

Pipe-Line Activity

Sheehan Is Awarded Contract For Line at Wilmington, Ill.

Sheehan Pipe Line Construction Co. was awarded contract by Stanolind Pipe Line Co. on January 3 for the construction of a section of pipe line in the vicinity of the TNT plant being built by the United States Government near Wilmington, Ill. The job calls for the laying of three lines on more than 15 miles of right-of-way. One of these is to be an 8-in. line; the other two lines are combination lines with less than a third consisting of 14-in. pipe and the balance 12-in. pipe. Work on the right-of-way is now under way.

Of the three trunk-line systems which must be moved because of this government project, Stanolind has the longest section of line affected by the program. For this reason it is pushing the work now in order to cooperate with the government undertaking, even though final arrangements are still in the process of being completed. The section which must be taken up on 15 miles of Stanolind right-of-way, consisting of one 8-in. and two 12-in. lines, crossing the government property, will be removed later.

It is expected that later in the year construction work will be done on shorter sections of right-of-way by Sinclair Refining Co. and Texas-Empire Pipe Line Co., but contracts for this work have not been let.

Williams Bros. Nears Completion Of Pan American Pipe Line

Williams Brothers Corp. will complete the crude-oil pipe line from East Texas to the Gulf Coast by January 20. This project consists of nearly 200 miles of 12-in. The work has been impeded by high water.

This firm has just completed approximately 100 miles of line for Magnolia Pipe Line Co. in West Texas which has been laid in two sections. These consist of 53 miles of 8-in. from the Duggan-Slaughter area southward to the Seminole field, and 47 miles of 8-in. delivering oil from a point near Seagraves to the Magnolia terminal at Midland.

For Standard Oil Co. of Louisiana, Williams Brothers Corp. is taking up 30 miles of 8-in. between Texarkana and Ida, Ark. This pipe is being used in the construction of a 33-mile line between Jena and Rapides, La. In the vicinity of De Queen, Ark., this contractor is reconditioning 20 miles of 8-in. on the Standard's trunk line.

Last week this contracting organization completed construction of 30 miles of 4-in. for Pure Transportation Co. near Crowley, La. For Sinclair Refining Co., pipe-line department, Williams Brothers Corp. has just finished work on 50 miles of 8-in. crude-oil line near Casper, Wyo., consisting of 16 miles of 8-in. between the Wertz pool and Parco and 34 miles of 8-in. between Casper and Welch. The ground was frozen but the job was carried on under good weather conditions.

In California, Williams Brothers and Haas, Inc., have completed a 22-mile 12-in. natural-gas line for Pacific Gas & Electric Co. This firm has also laid 16 miles of 16-in. to the antiaircraft post which is an extension of March Field, Army Air Service flying field. Williams Brothers Corp. has been laying a gas line for Georgia Power & Light Co. at Brunswick, Ga.

In recent weeks work has been carried on to complete marine terminal facilities at Port St. Joe, Fla., for Southeastern Pipe Line Co. preparatory to making gasoline shipments for several shippers which commenced December 27. Gasoline is moved by truck from the pipe-line company's terminal at Bainbridge, Ga.

Stanolind's New Missouri Line Nears Completion

Construction work on Stanolind Pipe Line Co.'s 165-mile 12-in. crude-oil pipe line between the La Plata, Mo., station and Wood River, Ill., is practically completed and will be put in operation this month. The line has been laid by Jones & Brooks, operating as Texokan Co. and O. C. Whitaker Co.

The Stanolind organization is doing some work on the Wyoming-Freeman, Mo., trunk line in a section in southeast Wyoming and Nebraska. It was necessary to lower and regrade several thousand feet of line at a number of points in a straightening and revamping program which becomes necessary because of the straightening of a nearby highway.

Sohio Buys Ownership of Michigan-Toledo Line

DETROIT, Mich.—Sale of his interest in the $2,500,000 Michigan-Toledo Pipe Line Co. to the Standard Oil Co. of Ohio to give Standard complete ownership has been announced by C. L. Maguire, of Mount Pleasant, head of both the Roosevelt Oil Refining Co. and Simrall Pipe Line Corp.

Future operation of pipe lines will be under Sohio Corp. Mr. Maguire's interest was not disclosed.

Originally organized in 1935, Michigan-Toledo constructed a 142-mile, 8-in. main line from Mount Pleasant to Toledo, Ohio, to provide Michigan fields with the first interstate pipe-line outlet. Since then the system has been expanded to include trunk lines from Mount Pleasant to all major Central Michigan producing districts. The system included about 300 miles of trunk lines at the time of the sale.

Negotiations are now under way to pipe about 4,500 bbl. of oil daily from Illinois fields to Central Michigan refineries through the line. Michigan production has dropped below refiners' needs.

Western Contracts With Cabot To Supply Milwaukee Project

Cabot Carbon Co., subsidiary of Godfrey L. Cabot, Inc., Boston, Mass., has contracted with Western Natural Gas Co. to furnish a portion of the gas which Western is planning to transmit to Milwaukee and other Wisconsin cities. This gas will come from acreage of Cabot Carbon Co., located in Texas County in the Oklahoma Panhandle.

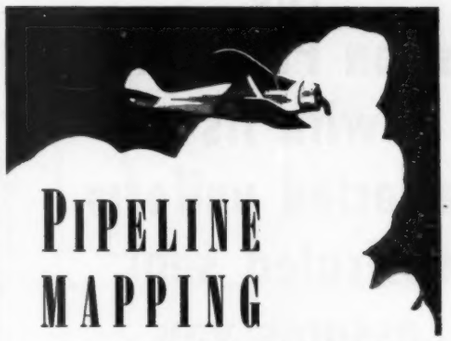
Pipe Line Is Damaged by Cable-Laying Equipment

The crude-oil pipe line of a major company was broken last week by telephone cable-laying equipment which crossed a 12-in. crude-oil line between Ransome and Manhattan, Ill. This cable-laying equipment was a special type which has been used in recent years; with this it is possible to rip through soft ground to a depth of 3 ft. or more, laying the cable and backfilling in one operation.

The telephone company was aware of the location of the line, it is reported, but had not consulted men in the pipe-line organization to determine the depth of the line. The cable equipment punctured the line, making a hole 4 by 4½ in., which leaked 3,000 bbl. of oil; 2,500 bbl. was lost. The leak occurred at the low-pressure end of the line where pressure was between 30 and 40 lb.

Lone Star Completes 48-Mile Line to Page

SAN ANGELO, Tex.—Lone Star Gasoline Co. of Dallas, Tex., has completed and tested in its 48-mile, 8-in. welded gas pipe line from San Angelo to the Page field in Schleicher County. Beginning May 6, 1941, the system will move gas from wells of Cooper Gas Co. of San Angelo to the West Texas Utilities Co.'s electric generating and water-pumping plant here to supply its fuel requirements. Earlier, it will furnish gas to the Air Corps Advanced Flying School here, due to be opened early in January.



PIPELINE MAPPING
AT MAXIMUM SPEED

An organization of more than three hundred employees; operating eight photographic airplanes—and prepared to supply accurate and dependable photographic mapping at maximum speed and minimum cost.

PHOTOGRAPHIC MAPS—accurate picture of the land, in scale, along the entire length of the contemplated route.

CONTACT PRINTS — overlapping exposures, permitting stereoscopic examination for contour and elevation data.

OWNERSHIP MAPS—traced from and controlled by the photographic map and containing all ownership and occupancy data for right-of-way purchase, as compiled by a highly trained corps of experienced abstractors and engineers.

EDGAR TOBIN
AERIAL SURVEYS

502 West Mistletoe — San Antonio Texas

HOUSTON OFFICE: COMMERCE BLDG.

Each week you will find complete coverage of pipe line news as well as special articles on pipe line construction and operation in

The Oil and Gas Journal

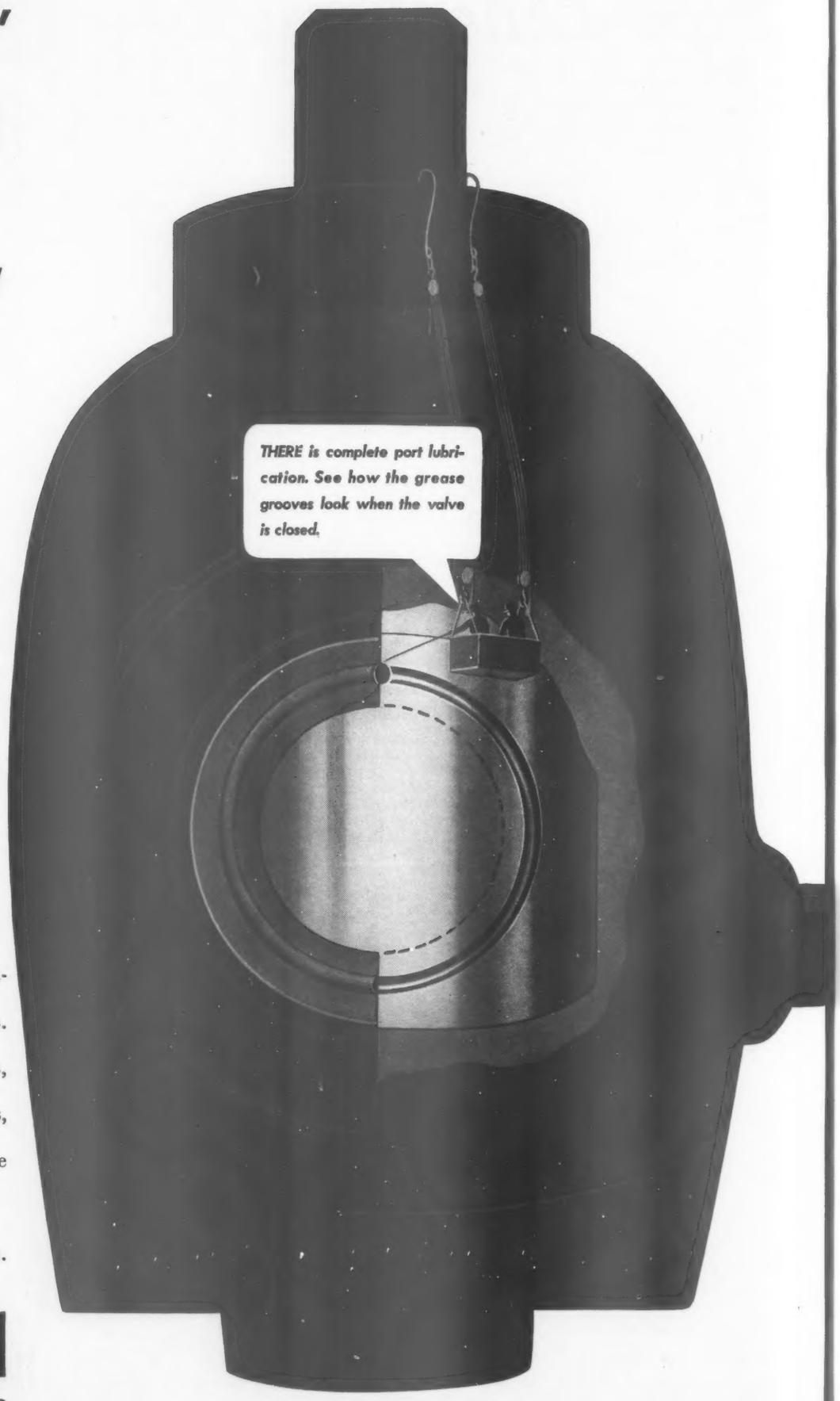
The Mission Plug Valve, with its perfected uniform lubricated seal, assures you longer satisfactory performance

The half-circle groove on the core and the half-circle groove in the body overlap. Result: seal grooves completely encircle each port. Pressure in the line is "put to work" to force grease from reservoirs, thereby keeping the grooves full of vital sealing grease at all times.

This combination gives complete, uniform lubrication—forms a perfect seal—insures easy turning. Prevents leakage by preventing abrasive material reaching the sealing surfaces.

These are the reasons why field tests, regardless of conditions and pressures, have proven the exceptional performance of the Mission Plug Valve.

Make your next plug valve a Mission.



MISSION MANUFACTURING CO.

HUMBLE ROAD • HOUSTON, TEXAS

EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Reported completions increased during the past week, owing to a revival of activity after the Christmas season. The increase is not, however, significant as reports are still irregular. Average daily production for the week remained low owing to the New Year's Day shutdown in Texas.

As the year opens, operators are encouraged by stiffening prices in Michigan, Kentucky, and some Louisiana and Texas points.

The Woodbine sand play at Hawkins was given added impetus by the gaging of a 2,910-bbl. well within the townsite and an estimated 50,000,000-cu. ft. gas blowout from the sub-Clarksville sand. Illinois recorded two new pools, Oklahoma one and Texas provided its quota of new sands and extensions. The campaign in Kansas is opening up with a lease play near the northwestern part of the state which is extending across the line into Nebraska. Michigan opened the year with the best well in many months, although it was located in the Walker field which has been on the decline for some time.

KANSAS: Some 2,250,000 acres is reported leased by major companies in Decatur, Rawlins and Norton counties and in the adjacent section of Southwest Nebraska (p. 56).

ILLINOIS: Wells extending West Liberty to the north and, apparently, linking it with Dundas on the south are among the best completions seen recently in Illinois. As a result of seven of these wells and better than usual completions in White County, the average initial production of new completions is 30 per cent higher than in recent weeks. Pools were opened near Dahlgren, Hamilton County, and Ribeyre Island, White County (p. 76).

CALIFORNIA: A closely watched test in the Williams area near Taft is drilling slowly through the Temblor, which is highly productive in Kettleman Hills and Belridge. Water is showing up on the west side of the Santa Maria Valley field (p. 72).

NORTH LOUISIANA: The Skelly-Sunray test at Athens which showed such promise a few weeks ago plugged back to test a Paluxy gas show. The test showed salt water (p. 62).

LOUISIANA GULF COAST: A fourth producing sand was found in the West Cote Blanche pool, St. Mary Parish, by a well which also proved the field to lie on a salt dome as it penetrated salt before being plugged back to the new pay. The west limit of the deep pay in Iowa is set by a well which is now plugged back to the 6,900-ft. sand (p. 75).

TEXAS GULF COAST: W. R. Davis' wildcat in the Garwood area, Colorado County, apparently opened up Wilcox sand production and Strake's test, 2½ miles south of the Alta Loma field, Brazoria County, attempted to blow out and may indicate a new pool. A gas show is reported in the Wilcox in the Magnolia area, Montgomery County. A 1-mile extension has been found at Chocolate Bayou, Brazoria County, and a new sand in the Greens Lake pool, Galveston County (p. 88).

NORTH TEXAS: To start off the new year at a rapid pace, new discoveries were reported in Young County and in the Fargo field of Wilbarger County where a third producing horizon was opened. Jack County's new Mississippian and Ellenburger discovery of the previous week is being deepened because of rapidly declining oil flow (p. 82).

EASTERN TEXAS: Both wildcat tests of the previous week, one in the Hawkins townsite in Wood County and one just a mile northwest of the town, blew in as producers early the past week. The townsite discovery has been gaged at 2,910 bbl. of oil daily from the Woodbine sand while the mile north test continues to blow an estimated 50,000,000 cu. ft. of gas uncontrolled (p. 78).

SOUTHWEST TEXAS: Saturation in a wildcat in Dimmit County and confirmed by a drill-stem test may indicate the first production for the county and a westward extension of the Balcones fault fields of about 50 miles. The producing formation is probably in the Navarro. The important Calhoun County test, south of Port Lavaca, is reported showing for a small producer in two sands in the Frio. Extensions recorded were: Fagan field, Refugio County, ½ mile west; Agua Dulce field, Nueces County, 1 mile south (p. 64).

OKLAHOMA: The state's first new field in 1941 was opened up in Okfuskee County, east of the Dill pool, near Okemah. Increasing activity is noted in the old Frederick pool of Tillman County as Arbuckle wells are being completed. The recompletion of depleted Wilcox wells in the Hunton continues at Coyle yielding initial production considerably higher than that of the new wells being completed at this time (p. 59).

EASTERN KENTUCKY: The recent lease play in Johnson County is bearing fruit as a small gasser is completed in the Corniferous lime (p. 87).

EAST TEXAS BORDER: A new gas field was established as a deep test in Shelby County plugged back to test the Paluxy. It yielded 5,000,000 cu. ft. (p. 62).

WEST TEXAS: A deep wildcat 9 miles west of the Apco field in Pecos County was testing for completion from the Ellenburger lime at the close of the week and also a projected Mississippian lime test in the recently opened Abell field of Pecos County was testing for completion from a shallow zone in the Permian lime. New wildcat tests were staked in Ward, Ector, Howard, Gaines and Yoakum counties during the week (p. 67).

WEST CENTRAL TEXAS: New and immediate development for the recently opened Kelso field in southern Jones County was seen following the announcement by the discovery firm, Danciger Oil & Refineries, Inc., of locations for two offsets to the discovery well. New wildcat tests were staked in Eastland, Fisher, McCulloch and Palo Pinto counties during the past week (p. 82).

MICHIGAN: Following a number of small completions in the declining Walker pool, a well in the Tallmadge Township sector struck a soft spot and came in for 400 bbl. an hour (p. 84).

COMPLETIONS IN ALL FIELDS . . .

(Week ended January 4, 1941)

	Oil	Gas	Dry	Total	1940 total comp. to date	1939 total comp. to date
N. Y., Pa., and W. Va.	72	16	3	91	91	70
Ohio	3	11	6	20	20	18
Indiana	0	0	0	0	0	3
Kentucky	2	2	4	8	8	9
Illinois	44	0	7	51	51	64
Michigan	5	0	6	11	11	21
Kansas	19	0	5	24	24	21
Oklahoma	21	3	12	36	36	28
Texas:						
North Central Texas	48	0	17	65	65	46
West Texas	32	0	1	33	33	37
Texas Panhandle	3	0	1	4	4	10
Eastern Texas	4	6	3	13	13	10
Texas Gulf Coast	14	0	3	17	17	28
Southwest Texas	8	0	3	11	11	35
Total Texas	109	6	28	143	143	166
North Louisiana	10	0	3	13	13	20
Louisiana Gulf Coast	5	0	1	6	6	23
Total Louisiana	15	0	4	19	19	43
Arkansas	3	0	1	4	4	8
Montana	2	0	0	2	2	6
Wyoming	4	1	2	7	7	3
Colorado	0	0	0	0	0	0
New Mexico	11	0	0	11	11	14
California	22	0	0	22	22	19
Miscellaneous	3	0	4	7	7	0
Total United States	335	39	82	456	456	493
Total previous week	274	47	95	416		
Week ended Jan. 6, 1940	336	45	112	493		

By
ROBERT INGRAM

Major Operators Lease Large Blocks on Nebraska Line

WHILE drilling was relatively light in Kansas, lease men were busy in the extreme northwest corner of the state, where tests are following the Barton arch. Reports were current that 2,250,000 acres had been taken up by major companies in the last 2 months along both sides of the Kansas-Nebraska line at Decatur, Norton and Rawlins counties.

Most of the leases were for 10 years and it was believed extensive preliminary geological and geophysical exploration would precede any drilling in the area. Some operators hope that soil analysis will play an important part in the development of this area because of the nature of the surface covering, which has not been particularly favorable to geophysical methods.

Attempts were being made this week to obtain production from Perry A. Thayer, Kiowa Drilling Co. and Derby Oil Co. 1 Roach, NW NW SE 12-22-14w, Stafford County, which had a show of oil in the Arbuckle at 3,749-67 ft.

First tests made only two bailers of heavy black oil an hour, but it was reported that the oil became a little lighter toward the bottom of the hole. Both butane and acid will be used after operators deepened the hole a little.

Bay Petroleum is drilling two tests in the county 1 P. Campbell, E½ NE NE 33-24-15w, and 1 Curtis, N½ NE SE 31-21-12w, and Shell has made location for 1 Allen, SW NE 29-23-11w.

Kansas wildcat activity took on new life last week with a total of 14 tests reported. Barton County took the lead in the number of locations with four reported. Greenwood County had two, and Stafford, Reno, Russell, Cowley, Franklin, Ellsworth, Brown, and Graham each had one.

SUMMARY OF COMPLETIONS

Kansas

	No.	Bbl.	Footage
Oil wells: Kraft	1	432	3,284
Silica	1	128	3,323
Stoltenberg	3	185	9,966
Bornholdt	1	1,789	3,228
Zenith	2	5,304	7,633
Trapp	1	3,321	1,113
Other fields	11	10,331	37,429
Dry holes: Fields	3	.....	10,488
Wildcats	2	.....	6,930
Total	25	.....	83,354

Nebraska

Oil wells: Falls City	1	618	2,249
Dry holes: Wildcats	2	.....	5,736
Total	3	.....	7,985

KANSAS COMPLETIONS

Barton County

Feltes pool: R. E. Day 2 Dolechek, S½ NW SW 13-16-12w, 3,000 bbl., Arbuckle 3,359-66 ft.
Kraft pool: Carter Oil et al 6 Kraft, E½ NE NE 10-17-11w, pumped 432 bbl., Arbuckle 3,281-84 ft.
Bloomer pool: Magnolia 2 Roesler, S½ NE NW 1-18-11w, shot Arbuckle 3,307-10 ft., temporarily abandoned, T.D. 3,380 ft.
Silica district: I. T. I. O. 7-A Schrepel, S½ NE NE 26-20-11w, pumped 128 bbl., Arbuckle 3,294-3,323 ft.

Butler County

Douglas pool: Plymate & Barnholdt 2-A Owne, NW NE NE 19-29-4, pumped 50 bbl., Lansing acidized 1,866-1,902 ft.

Cowley County

David pool: Gerald Smith et al 1 Finney, NW 36-30-4, Mississippi 3,014 ft., Kansas City lime 2,354 ft., T.D. 3,027 ft., dry.
Couch pool: Ryan Consolidated 1 Kennedy, SE SE SW 12-30-5, flowed 734 bbl., Barton 2,802-38 ft., natural.
Ryan Consolidated 1 Victory, SW SW SE 12-30-5, flowed 760 bbl., Barton 2,808-46 ft., natural.
Wildcat: Wakefield et al 1 Durham, W½ NW SE 34-30-3, Kansas City 2,437 ft., Mississippi 3,020 ft., Arbuckle 3,419 ft., T.D. 3,430 ft., dry.

Ellis County

Stoltenberg pool: Jayhawk Oil 3 Haska, N½ S½ SE 5-16-10w, pumped 65 bbl., Arbuckle 3,283-3,317 ft.
Magnolia 2 Haska, E½ SE SW 5-16-10w, pumped 110 bbl., Arbuckle 3,316-27 ft.
Atlantic Refining 1-B Matosh, N½ SE NE 34-16-10w pumped 10 bbl., Arbuckle 3,279-3,322 ft.
Burnett pool: Dickey 2 Gumble, N½ SW SE 6-11-17w, pumped 1,158 bbl., acidized Arbuckle 3,445-47 ft.
Wildcat: Aladdin & Norbia 1 Kuhn, N½ NE NW 17-14-16w, Fort Riley 1,995 ft., Topeka 2,911 ft., Lansing 3,181 ft., heavy black oil show 3,269-72 ft., base Kansas City lime 3,429 ft., Arbuckle 3,443 ft., T.D. 3,500 ft., dry.

Phillips County

Ray pool: Cities Service 1-B Hansen, SW NW 33-5-20w, 2,215 bbl., La Motte sand 3,567-84 ft.

Rice County

Bornholdt pool: Westgate-Greenland 4 Johnson, S½ SW SE 24-20-6w, pumped 1,789 bbl., Mississippi lime 3,275-3,328 ft.
Keesling pool: Bay Petroleum 1 Mitchell, S½ SW SW 3-20-9w, pumped 454 bbl., acidized Arbuckle 3,236-43 ft.

Rooks County

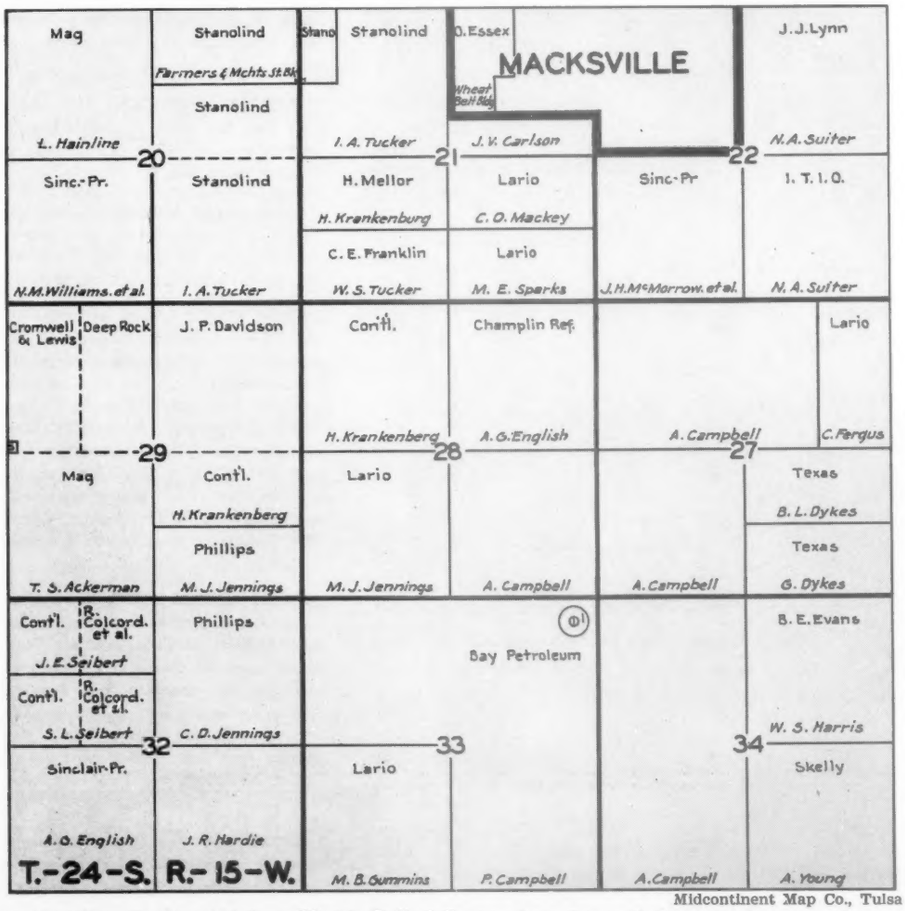
Laton pool: Co-Operative 5 Beardmore, S½ NE NE 10-9-16w, 2,327 bbl., Lansing 3,147-92 ft., T.D. 3,197 ft.

Russell County

Trapp pool: Cities Service 2-D Rogg, W½ W½ NE 9-15-13w, flowed 1,113 bbl., Lansing acidized 3,025-66 ft., T.D. 3,321 ft.
Mahoney pool: Sam Schneider 1 Kaps, N½ NW NW 17-14-12w, pumped 955 bbl., acidized Lansing 2,977-81 ft.

Stafford County

Zenith pool: Alf M. Landon 4 Equitable Life, W½ NW NE 15-24-11w, flowed 900 bbl., acidized Viola 3,798-3,828 ft.
E. H. Moore 6 Stewart, NL SW SE 12-24-11w, flowed 1,015 bbl. in 5½ hr., Viola 3,743-44 ft.
Kipp pool: Skelly 2-A Kipp, N½ SE NE 27-25-14w, flowed 296 bbl. in 8 hr., Lansing 3,752-3,889 ft.
South Snider pool: Shell 1-B Smith, NE 16-21-11w, Lansing 3,112 ft., Viola 3,467 ft., Simpson 3,522 ft., Arbuckle 3,624 ft., T.D. 3,631 ft., dry.



Midcontinent Map Co., Tulsa

Bay Petroleum Co. has started a wildcat in Stafford County, shown here with leases in the surrounding sections. Stafford County is getting its share of extensions to the Kansas play

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Jan. 4	Dec. 28
Burrton	7,200	7,200
Ritz-Canton	3,850	3,850
Graber	1,500	2,750
Hollow-Nikkel	1,700	1,700
Voshell	1,800	1,800
Wellington	1,000	1,100
Lorraine	1,050	800
Stoltenberg-Wilkins	4,025	4,320
Bloomer	4,050	3,700
Chase	5,200	3,550
Geneseo	3,700	4,100
Silica	15,800	14,000
Wherry	2,300	1,500
Trapp district	14,050	16,350
Balance Russell County	17,800	20,100
Sedgwick County	3,150	3,150
Bemis	9,050	9,750
Burnett	5,100	6,550
Kingman County	615	280
Stafford County	9,655	10,155
Greenwood County	7,750	8,750
El Dorado	6,850	7,150
Total Kansas	181,450	186,350

FOREST CITY BASIN

Skelly Oil Co. was testing this week to complete 4 Wallraff, NE SW 20-1n-16e, which at first was thought to be a failure. The well had the Hunton lime at 2,210-42 ft., was acidized and was estimated at 200 bbl. per day with considerable water. It is located on the western side of the pool where water intrusion has been large.

(Continued on Page 85)

CORROSION

INTERNATIONAL PROBLEM

RUST-BAN

INTERNATIONAL SOLUTION

REG. U. S. PAT. OFF.

Corrosion is an international problem of the most serious kind. Wherever iron or steel is used, the forces of corrosion are at work destroying valuable equipment. This destruction extracts from the nations of the earth a toll of millions of dollars annually. But for this international problem there now appears an international solution.

From amazing victories won in the Gulf Coast section of the United States, where corrosive forces are most severe, RUST-BAN,* the most complete line of rust preventives on the market, is reaching out to combat corrosion on wider and wider borders each day. RUST-BAN* is not a single product but a group of fifty rust preventives which collectively offer protection for iron and steel against most corrosive conditions.

Wherever it has been used, the RUST-BAN* oval has become the symbol of corrosion prevention, and almost without exception the war against rust has been waged successfully.

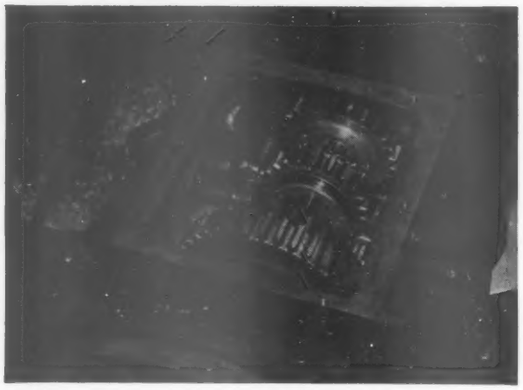
*RUST-BAN is registered in the U. S. Patent Office. For further information on RUST-BAN write Penola Inc., 26 Broadway, New York, or Humble Oil & Refining Company, Houston, Texas.

RUST-BAN* IS SOLD: In Texas by Humble Oil & Refining Co., Houston, Texas. • In New York and New England by Colonial Beacon Oil Co., New York City • In Pennsylvania by Standard Oil Co. of Pennsylvania, Philadelphia, Pennsylvania. • In New Jersey, Delaware, Maryland, District of Columbia, West Virginia, North Carolina and South Carolina, by Standard Oil Company of New Jersey, New York City. • In Oklahoma and Kansas and parts of Missouri by The Carter Oil Company, Tulsa, Oklahoma. • In Arkansas, Louisiana, Tennessee by Standard Oil Company of Louisiana, New Orleans, Louisiana. • In Kentucky, Georgia, Florida, Alabama, and Mississippi by Standard Oil Company (Ky.), Louisville, Kentucky. • In other states by Penola Inc., Pittsburgh, Pennsylvania. • In Canada by Imperial Oil Ltd., Toronto, Canada.

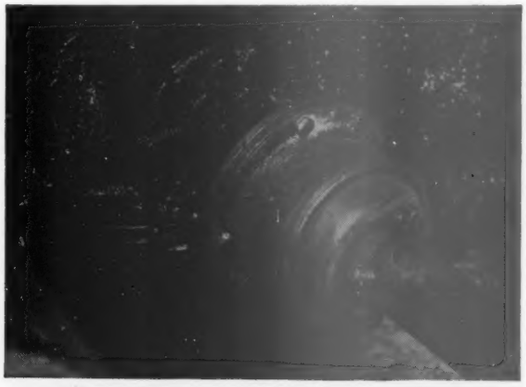
A. B. MUENZER, Supt. of Equipment, Page Dairy Co., Toledo, O.

Spicer Service Again Proved when Spicer Transmission and Universal Joints Operate for 1,100,000 Miles in this Page Dairy Co. Truck!

This is the Page Dairy Co. (Toledo, Ohio) truck that has traveled over 1,100,000 miles in daily service under heavy-duty conditions!



This is the Spicer Transmission that has consistently delivered the 1,100,000 miles of power in the Page Dairy Co. truck!



This is the Spicer Universal Joint that has stayed on the job for every one of the 1,100,000 miles delivered by the Page Co. truck!

THE Spicer units used in this old Acme truck are typical of the fine products developed by Spicer engineers and highly-trained mechanics.

Spicer reliability is a tradition of 38 years' standing—meticulously planned, carefully developed, relentlessly guarded . . . It is your most dependable guarantee of performance from the Spicer Equipment you buy. Specify Spicer for service!

Spicer Manufacturing Corporation
Toledo, Ohio

BROWN-LIPE
CLUTCHES and TRANSMISSIONS

SALISBURY
FRONT and REAR AXLES

38 YEARS OF
Spicer
SERVICE

SPICER
UNIVERSAL JOINTS

PARISH FRAMES
READING, PA.

By
ROBERT INGRAM

Okfuskee County Well Finds First New Oil Pool of 1941

SEVERAL Okfuskee County wildcats reached the pay-off stage this week. At least one proved a discovery. It was J. H. Harvey and Selden Henry 1 Dudgeon, NE SW SE 36-12-9e, north of Okemah. Shot in the Gilcrease at 3,084-3,110 ft., the well flowed as high as 65 bbl. an hour and was estimated at from 150 to 200 bbl. per day before being shut down for tankage.

While it opens up a nonproducing area south of the Cary pool and east of the Dill pool, it is just ¼ mile south of a test drilled years ago by the old Henry Oil Co. which flowed periodically from the Gilcrease but was never completed as a producer.

Originally the operators drilled to 4,126 ft. and tested both the Wilcox, which showed some oil and a great deal of water, and the Cromwell which was dry. It was then plugged back to the Gilcrease and shot with 53 qt.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Cumberland	1	7,344	5,075
Hewitt	2	115	4,609
West Hewitt	1	90	2,167
Cement	1	930	3,350
Sylvan	2	1,085	6,923
Dill	1	1,260	3,514
Other fields	13	2,008	33,451
Gas wells: Fields	3	*17	6,994
Dry holes: West Hewitt	1	.....	3,308
Other fields	5	.....	17,060
Wildcats	6	.....	32,769
Total	36	.....	119,220
Recompletions: Coyle	10	18,267	.....
Cement	1	1,652	.....
Hewitt	3	360	.....
Other fields	2	126	.....
Total	16	.....	.....

*Million cu. ft.

Shell Testing Near Welty

Another Okfuskee County test being watched closely was Shell 1 Davis, SW SW SW 18-13-9e, near Welty, where operators ran an electric log after swabbing 7 bbl. of oil and 74 bbl. of water in 24 hours from the Wilcox sand at 4,108-20 ft.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Jan. 4	Dec. 28
Allen	4,800	4,825
Billings	6,250	6,225
Burbank	7,225	7,200
South Burbank	7,325	7,350
Balance Osage	16,500	16,625
Blackwell district	3,350	3,375
Bristow-Slick	6,225	6,200
Chandler	1,025	1,050
Crescent	1,975	1,975
Cromwell	2,800	2,825
Cushing-Shamrock	8,800	8,850
Duncan	3,550	3,550
Edmond	3,600	3,675
Fish	2,850	2,850
Fitts	13,900	13,950
Jesse	2,025	2,025
Graham-Fox	2,200	2,200
Gray	825	850
Healdton	8,300	8,325
Hewitt	7,525	7,500
Keokuk	2,650	2,650
Konawa	1,000	1,000
Lucien	6,425	6,450
Moore	1,050	1,075
Northeastern counties	16,900	16,850
Oklahoma City	102,075	93,775
Olympic	1,750	1,750
Ramsey	3,500	3,500
Sasakwa	1,750	1,375
Sholem-Alechem	2,550	2,550
Seminole district:		
Bowlegs	6,425	6,425
Carr City	2,150	2,150
Dora	1,550	1,550
Earlsboro	3,875	3,875
East Earlsboro	1,725	1,725
South Earlsboro	500	525
Little River	6,550	6,550
East Little River	625	625
Maud	450	475
Mission	1,250	1,225
Seminole	6,225	6,225
East Seminole	1,025	1,025
Searight	1,800	1,800
Total Seminole	34,150	34,175
St. Louis-Pearson	21,400	21,375
Tatums-Tussy	5,200	5,250
Tonkawa-Garber-Thomas	3,350	3,525
Wewoka	1,525	1,450
Yale-Jennings	3,050	3,100
Total Oklahoma	404,625	397,100

Several good wells were completed in the proven areas of the county. At Dill, the I. T. I. O. 3 Miller flowed 63 bbl. an hour, total depth 3,566 ft. In the East Cromwell pool, Sunray 1 Replogle was completed for 432 bbl. a day and the company was starting 2 Replogle as a south offset. And the Titus 2 Berryman, also in East Cromwell, flowed 600 bbl. a day from the Cromwell at 3,419-27 ft.

Coyle Wells Plugged Back

Ten old Wilcox producers in the Coyle pool were reported during the week as recompleted in the Hunton lime which was passed up in the first development of the field. The Texas Co. reported six of the recompletions, Magnolia one and Amerada three. Average daily production of the ten was 1,826 bbl.

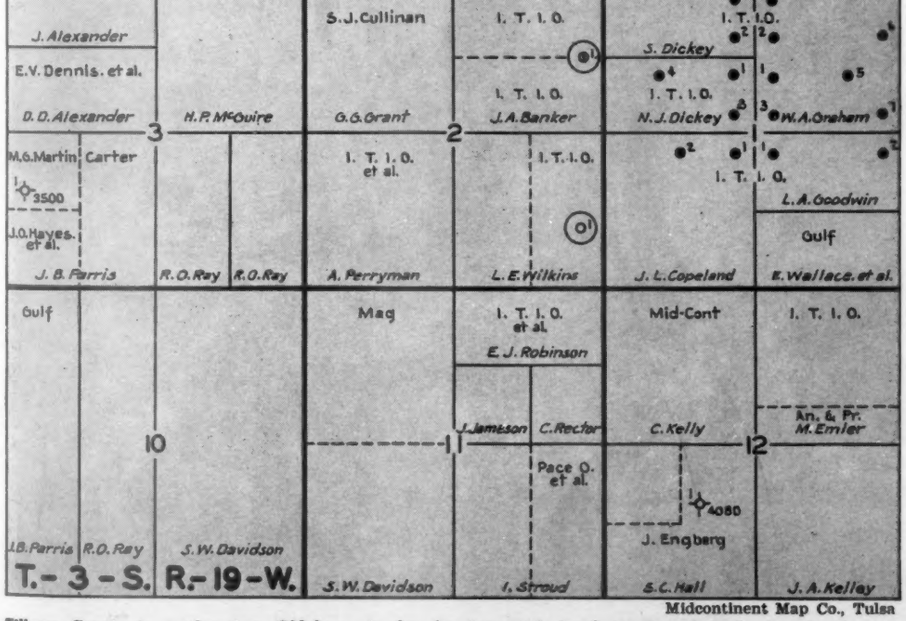
Usual practice in the area is to plug back about 100 ft. above the Wilcox and then perforate at the Hunton which runs about 300 ft. higher than the Wilcox.

Southwestern Oklahoma Gets Play

Arbuckle lime production for the Frederick pool of Tillman County in the southwestern part of the state was extended ½ mile westward by the I. T. I. O. and Foster Petroleum Corp. 1 Banker, E½ NE 2-3s-19w. The well flowed 210 bbl. in 9 hours from dolomite topped at 5,071 ft. and penetrated to 5,103 ft. Earlier, a good oil showing was made in the Canyon lime at about 3,000 ft. It marks the fifth oil well to be completed from the Arbuckle in the area.

I. T. I. O. is drilling two other holes in the same pool.

Two outposts of the Hobart field of Kiowa County were in the testing stages. They were Gled Oil 1 Howard, SW SW NE 20-7n-17w, and Artie Baker 1 Coakley, NW NE SE 30-7n-17w. Shell Oil Co., Inc., completed 4 Ratliff, NE SE NE 19-7n-17w, on the west side of the Hobart field, after it made 247 bbl. in 24 hours.



Midcontinent Map Co., Tulsa

Tillman County in southwestern Oklahoma is due for increased development and exploration in the near future. Shown here is the location of an I. T. I. O. extension of Arbuckle lime production in the Frederick pool

OKLAHOMA COMPLETIONS

Bryan-Marshall Counties

Cumberland pool: Pure 4 Little-100, NE NW SE 28-5s-7e, flowed 138 bbl. in 4½ hr. through ¼-in. choke, casing 4,867 ft., first sand zone 4,756 ft., second sand zone 4,872 ft., T.D. 5,075 ft.

Carter County

Ed Cox pool: Elliott 3 Pierce, SW NE NE 22-2s-2w, pumped 16 bbl., sand 758-1,086 ft., T.D. 1,190 ft., casing 852 ft.

Healdton pool: Magnolia 84 Richards, SW SE 31-3s-3w, pumped 74 bbl., casing 1,067 ft., T.D. 1,077 ft.

Hewitt pool: Batson 2 Walker, NW SW NE 20-4s-2w, old well drilled deeper from 1,985 ft. to 2,017 ft., T.D., pumped 110 bbl.

Gibson 2 Walker, SE NW NE 20-4s-2w, old well drilled deeper from 2,137 ft. to 2,175 ft., shot 2,115-44 ft., pumped 200 bbl.

Turner 9 Stearns, SW SE SW 21-4s-2w, location abandoned.

Jones 7 Griffin, N½ NW NW 26-4s-2w, rig abandoned.

Turner 2 Ward, SW NW NW 28-4s-2w, old well drilled deeper from 2,251 ft. to 2,385 ft., sand 2,365-85 ft., pumped est. 50 bbl. oil and some water.

Turner 7 Ward, SE NW NW 28-4s-2w, pumped 40 bbl., casing 2,295 ft., T.D. 2,340 ft.

Turner 8 Ward, NE NW NW 28-4s-2w, pumped 75 bbl., casing 2,247 ft., T.D. 2,269 ft.

West Hewitt pool: Anderson 1 Martin, NE SE NW 18-4s-2w, sand stain 2,165-70 ft., T.D. 3,308 ft., dry.

Smith 1 Ward, N½ NE NE 19-4s-2w, pumped 90 bbl., casing 2,149 ft., sand 2,163-67 ft., T.D.

Caddo County

Cement field: Magnolia 2 Pau-Kune, N½ NW NE 10-5n-9w, old well drilled deeper from 2,416 ft. to 3,396 ft., potential 1,652 bbl. flowing through tubing, sand 3,372-94 ft., casing 3,367 ft.

Ohio 7 Bruce, SW NE 11-5n-9w, flowed 155 bbl. in 4 hr., casing 3,337 ft., T.D. 3,350 ft., perf. 3,295-3,319 ft.

Comanche County

Wildcat: H. Phillips 1 Reich, NW SW 24-4-10w, cored 2,887-2,901 ft., T.D., dry.

Creek County

Kellyville district: Strozier 1 Anicker, SE NE NW 18-17-10e, Wilcox 3,094-3,105 ft., T.D., dry.

Wildcat: Brauer 1 King, W½ SE NW 31-16-7e, 2,000,000 cu. ft. gas, sand 1,175-93 ft., T.D., casing 1,177 ft.

Cushing area: Smith 1 Hohl, SE SW NE 26-19-7e, pumped 20 bbl., casing 2,685 ft., shot 2,690-2,715 ft., T.D. 2,720 ft.

(Continued on Page 85)

★ FOR CORE DRILLING ★ SLIM HOLE DRILLING ★

Try this U.

PORTABLE RIGS—as the one above, exhibited at last year's Tulsa Oil Show, are an easy setup for U. S. High Pressure Portable Rig Hose, no matter how tough the job!

CORE DRILLING (where drilling is shallower and smaller sizes required) holds no problems for U. S. Core Drilling Hose. This hose has a special wire braid construction and is made in 1½ in. I.D. size only. For geophysical testing of strata, and where drilling is shallow, rugged smaller size, fabric built, U.S. Rainbow Geophysical Hose —without wire reinforcement —will serve adequately.

★ ACIDIZING ★ OIL WELL CEMENTING...

S. High Pressure Portable Rig Hose!

It's light! It's flexible! It's a "natural" for portable rigs!

Top worker of the oil fields is U. S. High Pressure Portable Rig Hose—Jack-of-all-trades—and *master* of all! A combination construction similar to U.S. Peerless Rotary Hose, this hose can be used for all these services. It stands the highest pressures under these working conditions—yet is lighter, much more flexible, and operates better on portable rigs than any standard rotary hose!

Built in 2 in. and 2½ in. I.D. sizes in lengths up to 60 ft., U.S. High Pressure Portable Rig Hose has a specially designed acid-and-abrasion-resisting tube, making it uniquely adaptable to high pressure, acidizing service. And its lightness, flexibility, and extreme resistance to pressures make its use most desirable in oil well cementing. Furnished with U. S. Special Streamlined, Built-in, Full Flow Couplings, or, if preferred, with "Boss" Duplex or Shaffer standard rotary couplings. This hose may also be furnished with a synthetic rubber tube or cover for use in oil circulating service.

"RUBBER DOES IT BETTER"

United States Rubber Company

ROCKEFELLER CENTER · 1230 SIXTH AVENUE · NEW YORK

SERVICE BEYOND PRICE AND SPECIFICATIONS

OIL WELL CEMENTING is well handled by U. S. High Pressure Portable Rig Hose.

Wilcox Play Extends Across Central Louisiana

By GEORGE WEBER

SHREVEPORT, La., Jan. 6.—Strong leasing and increasing geophysical activity, followed by sustained wildcatting marked the Wilcox play which at this time extends through Central Louisiana from Natchitoches Parish to the Mississippi River. Two new wildcat locations each in Tensas and Grant parishes added to the current drilling in Caldwell, La Salle and Tensas parishes. Olla, whose discovery touched off the new interest in the lower Wilcox, rounded the year with 93 oil wells, the most important discovery in 1940. The Nebo field, also in La Salle Parish, has been successively extended, with one rig active, although other drilling is expected by operators other than the sole current producer in the field, H. L. Hunt.

In Natchitoches Parish, J. E. Watts is attempting to make an oil well out of 1 Tanner. The test shows oil and salt water at 3,240 ft. To the north in Red River Parish, Thornton & LaCroix shot a sand at 1,204-51 ft. with 10 qt. of nitroglycerin and are pumping approximately 5 bbl. of oil daily from the wildcat, 1 Prudential Life Insurance Co. To the southwest in Sabine Parish, Roy Raines reports a small show of oil in 1 Carter.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	Jan. 4	Dec. 28
Caddo, light	5,965	5,590
Caddo, heavy	2,250	2,170
Cotton Valley	13,575	13,600
Cross Lake	3,590	3,010
De Soto	1,000	1,000
Haynesville	2,625	2,640
Homer	2,660	2,675
Lisbon	2,990	2,975
Olla	8,800	8,500
Rodessa	17,000	17,010
Sligo	1,415	1,535
Sugar Creek	945	1,070
Urania	2,260	2,270
Zwolle	1,375	1,380
Total North Louisiana	68,960	67,940
Rodessa, Texas	14,325	14,400

SOUTH ARKANSAS

Atlanta	2,415	2,420
Buckner	2,025	2,010
Champagnolle	1,170	1,165
Dorcheat	1,325	1,280
El Dorado	1,630	1,625
Magnolia	19,400	19,410
Nick Springs	1,100	1,050
Rodessa	1,530	1,550
Schuler	16,575	16,550
Smackover, light	1,550	1,550
Smackover, heavy	13,580	13,600
Troy	1,130	1,130
Urbana	1,725	1,520
Village	1,055	1,005
Total South Arkansas	69,135	68,525

Claiborne Activity Quiet

The deep tests in Claiborne Parish showed little development of interest during the past week. Union Producing Co. has set protective casing in 1-A Meadows, but will not perforate or test the gas show in the top of the Smackover at 10,393-10,403 ft. until deeper prospects are explored.

At Athens, Skelly and Sunray met with failure in attempting to prove production in a higher sand in 1 Valentine. The perforations at 6,316-33 ft., through which the well made gas condensate, were squeezed, the well plugged back and perforations shot in the James lime at 5,326-34 ft. The test showed salt water and operations are shut down at the well.

NORTH LOUISIANA COMPLETIONS

Caddo—Caddo Parish

Lloyd A. Farr 1 B. R. Goodwin . . NW NE NW 32-21-15
100 bbl. open tubing, 4,000 gal. acid, 6⅝-in. casing 1,517 ft., T.D. 1,616 ft.

Gulf 17 Tyson . . . . . NE SW 14-21-15
Pumped 55 bbl., 4,000 gal. acid, 6-in. casing 1,569 ft., T.D. 1,735 ft.

E. E. Johnson 1 Stinson . . . . . NW NE SW 32-21-15
Pumped 15 bbl. oil, 20 bbl. b. s. & w., 7-in. casing 1,365 ft., T.D. 1,521 ft.

Louisiana Oil Prod. Co. 4-C Muslow . . . . . SW NW NW 9-20-15
Location abandoned.

G. McClenaghan 3 Handschumacher . . . . . SE NW SW 18-21-15
Heading 50 bbl., T.D. 1,635 ft., 6-in. casing 1,520 ft.

S. Reele 1 Ramsey . . . . . NE SE NE 32-21-15
Pumped 30 bbl., 50 per cent b. s. & w., 4,000 gal. acid, 6⅝-in. casing 1,372 ft., T.D. 1,597 ft.

W. E. Stewart et al 1 Forester-Downer . . . . . NE SW 32-21-15
Pumped 10 bbl. oil, 20 bbl. b. s. & w., 7-in. casing 1,373 ft., T.D. 1,523 ft.

Olla—La Salle Parish

Ark. Fuel Oil 2-C Goodpine . . . . . NW NE 24-10-2e
168 bbl., 3 per cent b. s. & w., ⅛-in. choke, T.P. 100 lb., C.P. 280 lb., perf. 2,225-30 ft., 7-in. casing 2,231 ft., T.D. 2,231 ft., lower Central sand.

Ark. Fuel Oil 1-A Randall . . . . . NW NW 13-10-2e
Salt water, 10¾-in. casing 201 ft., T.D. 2,370 ft., all sands salt water.

Placid 52 Louisiana Central . . . . . NE SW 36-10-2
140 bbl., 20 per cent b. s. & w., 10/64-in. choke, T.P. 280 lb., C.P. 420 lb., 7-in. casing 2,427 ft., perf. 2,220-26 ft., T.D. 2,427 ft.

Placid 70 Louisiana Central . . . . . NE NW 30-10-3
204 bbl., 2 per cent b. s. & w., T.P. 180 lb., C.P. 430 lb., 7-in. casing 2,400 ft., perf. 2,196-2,212 ft., lower Central sand, T.D. 2,400 ft.

Nebo—La Salle Parish

H. L. Hunt 7-A Goodpine . . . . . SW SW 9-7n-3e
352 bbl., 6 per cent b. s. & w., ⅛-in. choke, T.P. 975 lb., C.P. 1,365 lb., 7-in. casing 3,891 ft., perf. 3,515-19 ft., T.D. 3,895 ft.

Wildcat—La Salle Parish

Sinclair Prairie Oil Co. 1 Goodpine . . NE SE 28-9-3e
T.D. 4,515 ft., dry, top Wilcox 2,180 ft.

Wildcat—Union Parish

Tiki Exploration Co. 1 Jones . . . . SE SE NW 30-21-3w
T.D. 3,200 ft., salt water.

SUMMARY OF COMPLETIONS

North Louisiana

	No.	Bbl.	Footage
Oil wells: Caddo	6	*260	9,627
Olla	3	*512	7,057
Nebo	1	*352	3,895
Dry holes: Olla	1	.....	2,370
Wildcats	2	.....	7,715
Total	13	.....	30,664

Arkansas

Oil wells: Buckner	1	*413	7,315
McKamie	1	*290	9,366
Urbana	1	*237	3,055
Dry holes: Lisbon	1	.....	6,821
Total	4	.....	26,554

East Texas Border

Gas wells: Waskom	2	†26.3	12,216
Carthage	1	.....	5,040
Wildcat	1	†8.0	6,085
Total	4	.....	23,341

*Barrels. †Million cu. ft.

NORTH LOUISIANA DRILLING REPORT

Bienville Parish

R. W. Burnett 1 Locke . . . . . NE NW NE 9-15-10
T.D. 1,100 ft., S.D.

Caddo Parish

W. G. Ray Drlg. Co. 1 Noel Est. . . . . SE 30-21-14
Drilling black shale 6,817 ft.

Caldwell County

V. V. Ryan 1 La. Central . . . . . NE NE 16-12-4
Set 10-in. casing 105 ft., S.D. 125 ft.

Claiborne Parish

Skelly and Sunray 1 Valentine . . . . NW NW 31-20-6w
Squeezed perf. at 6,316-33 ft., P.B. 6,244 ft., perf. James lime 5,326-34 ft., tested salt water, T.D. 6,507 ft.

Union Prod. Co. 1-A Meadows . . . . . NE 18-21-4
Set 7-in. casing 10,393 ft., T.D. 10,403 ft., preparing to core ahead.

De Soto Parish

J. E. Stack et al 1 Cook . . . . . NW NE 32-13-14
T.D. 2,040 ft., S.D.

Wildcat—Grant Parish

Bering Oil Co. 1 Goodpine . . . . . SW NE 18-8n-1w
First report.

Smith, Lloyd et al 1 Swope . . . . . NW SE 16-9n-1e
First report.

La Salle Parish

Delta Drlg. Co. 1 Hughes . . . . . NE NE SW 22-8-1e
T.D. 4,002 ft., arranging to deepen.

Harry Shulman et al 1 V. B. Whidden . . SW NE 9-9n-3e
Set 10¾-in. casing 224 ft.

Hunter Co. 1 Pipes . . . . . SW SE 18-8n-3e
Drilling shale and sand 3,307 ft.

Natchitoches Parish

J. E. Watts 1 Tanner . . . . . SW SW NW 18-10-10
Tested salt water, show oil 3,240 ft., S.D.

Red River Parish

Thornton & LaCroix 1 Prudential Life Ins. Co. . . . . SW SW NW 31-11-9
T.D. 1,317 ft., 10-qt. shot 1,204-51 ft., cleaned out, pumping approximately 5 bbl. oil.

Sabine Parish

Roy Raines 1 Carter . . . . . SW NW NW 27-9-11
T.D. 2,068 ft., tested small show oil, waiting on orders.

J. E. Watts 1 Cook Land Co. . . . . W½ SW NE 27-10-11
T.D. 3,435 ft., S.D.

Tensas Parish

H. L. Hunt 4 Chicago Mill & Lbr. Co. SW NW 14-13-10
Coring 3,613 ft., top Wilcox 2,850 ft.

H. L. Hunt 2 Ayers Timber Co. . . . . NW NE 18-14-11

Pope & Shields 1 Panola Co. . . . . SE SE NW 34-13-12

West Carroll Parish

Phillips & Thornton 1 Bruce Lbr. Co. . . . . NE SW SW 15-21-9e

ARKANSAS

An increase in interest in South Arkansas is seen in a resumption of deep wildcat exploration to the Smackover lime. South Arkansas saw a very quiet period during the last half of 1940, but new operations indicate an upturn in activity.

Besides the Crow Drilling Co. test, spudded in the shallow Stephens field of Columbia County, three other deep Smackover wildcats are planned; in the Macedonia area of Columbia County east of Dorcheat, in the Smackover field, and east of Schuler, Union County. In the old South field, El Dorado, Union County, C. H. Murphy 1-C Cates, another deep test is drilling below 2,300 ft.

The McKamie field, discovered last May, but little developed, seems due for active drilling in 1941. The Normandie Oil Corp. completed 1 Cornelius last week, extending production approximately ½ mile northeast. Offsets to the Normandie well have been staked by Atlantic Refining Co., and Barnsdall Oil Co. is entering active drilling participation in the three-well field. The deepest current Smackover wildcat, E. G. Bradham 1 Slaughter, was abandoned last week. Located in the Lisbon field of Union County, it had held the close attention of oil operators. The Smackover lime was topped at 6,708 ft., the first porosity at 6,724 ft. and the main porosity at 6,731 ft., showing salt water.

ARKANSAS COMPLETIONS

Buckner—Columbia County

J. W. Love et al 1 H. B. Eddy unit . . . SW SE 12-16-23
413 bbl., ¼-in. choke, T.P. 275 lb., C.P. 200 lb., 1.2 per cent b. s. & w., 4,000 gal. acid, 5½-in. casing 7,280 ft., T.D. 7,315 ft., Smackover lime.

McKamie—Lafayette County

Normandie Oil Co. 1 R. Cornelius . . NW SW 28-17-23
290 bbl. condensate, ⅛-in. choke, T.P. 2,700 lb., C.P. 3,000 lb., gas-oil ratio 8,000 cu. ft. per bbl., 5½-in. casing 9,347 ft., perf. 9,285-93 ft., T.D. 9,366 ft., Smackover lime.

Lisbon—Union County

E. G. Bradham et al 1 A. E. Slaughter . . . . . SE SE SE 9-17-16
T.D. 6,821 ft., top Smackover 6,708 ft., salt water, abandoned.

Urbana—Union County

Marine Oil Co. 15-A Thompson . . . NE SW SE 3-18-13
237 bbl., 14/64-in. choke, T.P. 250 lb., C.P. 1,050 lb., 8 per cent b. s. & w., perf. casing 3,000-08 ft., T.D. 3,055 ft.

ARKANSAS DRILLING REPORT

Clark County

Coker Oil Corp. 1 Guess . . . . . NE SE NE 2-11-20
S.D. 612 ft., show oil.

Coker & Grieves 2 S. H. Guess . . . . SE SW NE 2-11-20
S.D. 630 ft., very slight show oil.

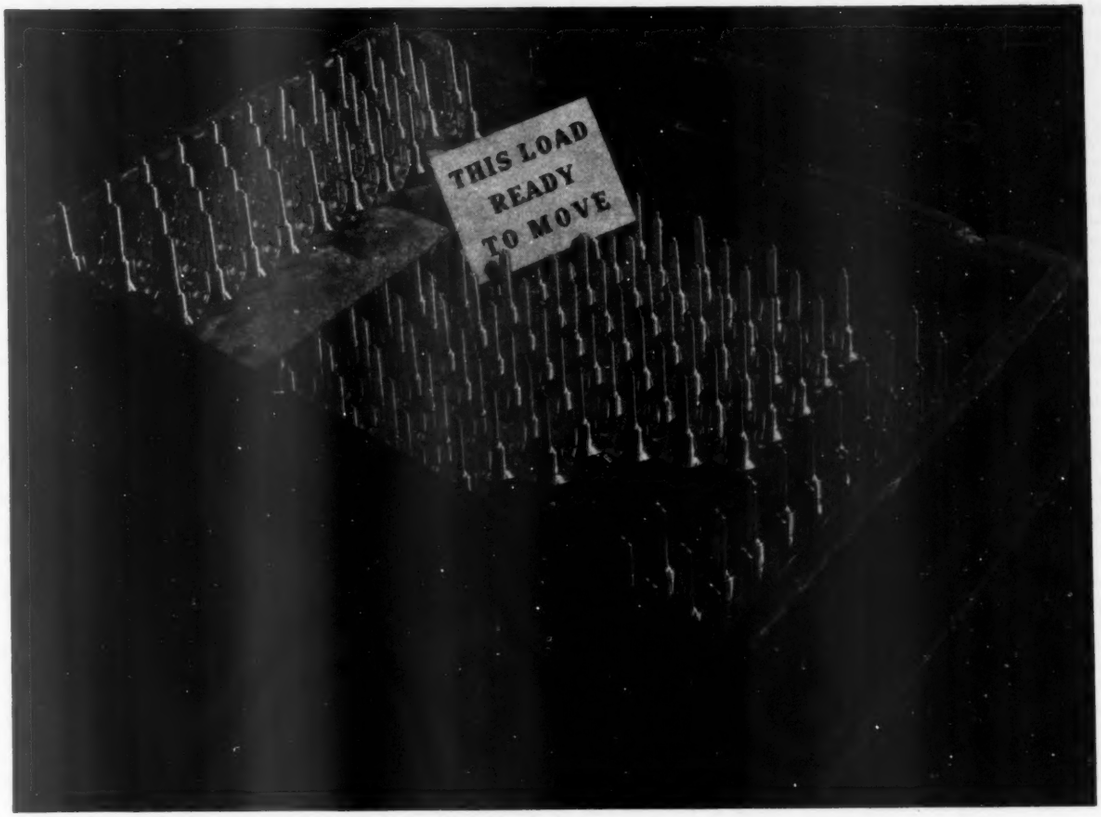
W. S. King 1 McKenzie . . . . . SE SE NW 30-10-19
S.D. 270 ft.

W. P. Wilson 1 Hamilton & Mathews SW NW 32-10-20
S.D., high water, T.D. 1,572 ft.

Ouachita County

Berry Asphalt Co. (formerly A. H. Boswell) 1 G. S. Martin . . . . . NE SW 17-14-19
Drilling 957 ft., 10-in. casing 40 ft.

(Continued on Page 64)



Taylor Is Helping America Hang Up a Sign

HAVE you seen the signs? Look anywhere. Look in that factory, out Seattle way. There's the sign—*This Load Ready to Move*—on that bin of finished bolts. Look in that big airplane plant. There's the same sign, on that sleek Army streamliner. Look in that oil refinery. See the sign, over there, on that string of flat cars? It's on that mountain of clothing, too—it's on that pile of canned foods.

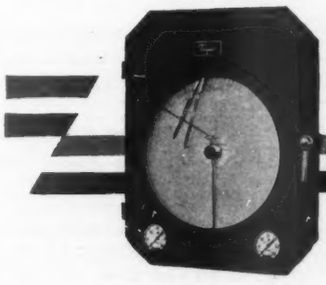
American Industry is producing at top speed today. Producing the goods that this nation needs. Producing faster, much faster. In a steady, reassuring, growing stream, vitally necessary products are rushing out of plants and factories. America is going to be ready, just in case . . .

Preparing to protect ourselves and our ways is a huge job that can't be done slipshod. We've got to work well, and we've got to work fast. We *are* working fast. We can do it, because we're lucky.

No other Industry in the world is equally equipped to produce quality in high gear. No other Industry has better, more modern machines. No other Industry has finer instruments to *help* these machines produce.

Times like these make instruments like the great new Taylor Fulscope Controller an absolute industrial "must." Today all plant operations *must* be automatically more exact, automatically more foolproof, automatically faster, more efficient. Machines must think for themselves more clearly. The Taylor Fulscope helps them to do that.

Taylor Instruments have never had a bigger opportunity to "show their stuff." Fact is, these are Taylor times. Taylor Instrument Companies, Rochester, N. Y. Plant also in Toronto, Canada.



BE PREPARED WITH **Taylor**

The New Taylor Fulscope Controller
The "Not 1, but 5" Instrument

Indicating / Recording · Controlling

TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS

SOUTHWEST TEXAS

Dimmit County Wildcat May Open Important Play

By
F. L. SINGLETON

CORPUS CHRISTI, Tex., Jan. 6.—Interest in the Southwest Texas district was centered on Calhoun County in the Lower Gulf Coast district and in Dummit County in the Balcones fault line where production tests were being made on two promising wildcats. Other developments of interest included important extensions to several proven fields.

In the Balcones fault line district, and located in the Carrizo Springs area, Dimmit County, Producers Corp. 1 S. E. Knight cored porous saturated sand at 2,294½-98 ft., and on a 15-minute drill-stem test with a ¾-in. choke on bottom and a ⅜-in. choke on top, 160 ft. of 30-gravity oil was recovered, and the well tested 5 lb. working pressure. Bottom-hole pressure was 100 lb. Casing was cemented and the well is scheduled to be tested the first of the week. The sand section has been tentatively identified as the Navarro, and a showing of oil in the upper section was logged at 2,240-56 ft., although a drill-stem test recovered salt water with a slight show of oil and gas. The well has been watched with considerable interest since it showed for a gasser on a drill-stem test at 1,700-17 ft. Location is in the G.W.T.&P. Survey 643, about 5 miles west of Carrizo Springs. If successfully completed it will open the first production for the county, and open the way for considerable exploration along this particular trend in which only a few tests have been drilled during the past few years.

While no gage was available, McSpadden Co. 1 Clark, 8½ miles south of Port Lavaca, Calhoun County, was reported to be showing for a producer while it cleaned out through a small choke after perforating casing in the Frio formation at approximately 5,890-92 ft. The hole is bottomed at 6,240 ft., and 5½-in. casing was cemented at 5,960 ft. Although little information has been released, two sand sections at 5,800 ft., and 5,900 ft. are reported to have been cored while an electrical survey is reported to have showed "kicks" at 2,700 ft. and 3,400 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Lower Gulf Coast			
Oil wells	3	353	19,598
Dry holes: Fields	1	.....	5,362
Total	4	353	24,960
Laredo District			
Oil wells: Colorado	2	539	6,004
Other fields	2	98	3,742
Dry holes: Fields	1	.....	5,400
Wildcats	1	.....	2,958
Total	6	.....	18,104
San Antonio District			
Oil wells	1	2	553

In Caldwell County and located as a north outpost test to the Tinney Creek field, Wiegand Brothers 1 J. J. Freeman was abandoned in the Edwards lime at 2,950 ft. after topping the section at 2,948 ft. The Austin chalk was topped at 2,450 ft. and the formation was drilled to 2,460 ft. which carried a show of oil. Seven-inch casing was cemented at 2,450 ft. and salt water with a slight show of oil and gas was recovered.

Fagan Field

In the Corpus Christi area, and located about ½ mile west of the Fagan field, Refugio County, Barnsdall 4 Marberry was completed through perforated casing at 5,621-33 ft. for an initial production of 129 bbl. per day through a ⅛-in. choke. Tubing pressure was 375 lb. and casing pressure 950 lb. This is the first completion for the field in several months.

On the southeast flank of the Agua Dulce field, Nueces County, and located approximately 1 mile south of production, S. E. W. Oil Corp. 2 Pfluger marked up another important extension to this new area as the well flowed an estimated 35 bbl. of distillate per day while testing through a 4/64-in. choke. Tubing pressure was 2,600 lb. and casing pressure 2,400 lb. Drilled to a total depth of 7,143 ft., 5½-in. casing was cemented at 7,140 ft. and the completion was made through perforated casing at 6,997-7,012 ft.

In the same county and located along the same trend, but east of the Stratton field, F. A. Gillespie 1 Dabney which opened a new gas-distillate area several weeks ago continues to test and is flowing at the rate of 2 bbl. of distillate per day through a 4/64-in. choke. Tubing pressure is 2,325 lb. and casing pressure 2,400 lb. Since the opening of crude production on the flanks above gas-distillate structures, wide attention has been attracted to this trend which is expected to result in considerable wildcatting extending for a distance of several miles along the east sides of the two structures.

Mud Island Prospect

On the Mud Island prospect, offshore from Aransas County in Aransas Bay, Gulfboard 1-239 State is testing through perforated casing at 9,210-16 ft. and the well is cleaning out showing lots of drilling mud and a small amount of high-gravity oil. This well has been in the process of completion for several weeks, but final completion has been delayed due to excessive gas pressure which has resulted in the use of extremely havy drilling mud, and several days will be required before the well is thoroughly cleaned.

Location for an interesting test was made in the Weser area, Goliad County, by W. R. Davis Co., Inc., which is moving in material for 1 Ollie Webb, located about 3,500 ft. west of the company's 1-B Albrech, recently completed as a small producer to open the first oil production in the field from the Cook Mountain formation at 5,200-5,300 ft.

In Live Oak County, and located in the George West area, Edwin M. Jones has derrick up for 3-B George West located in the Nelson Owen Survey 56, 4 miles southwest of the town of George West. Location is 1,980 ft. from the northwest and southwest lines of the survey. This is a projected Wilcox trend, and the progress will be watched with wide interest as it is the second deep test for the area, being located 2 miles from the operator's 2-B George West which logged several interesting showings in the Wilcox zone, and the well flowed high-gravity oil for several days before it was finally abandoned.

Location for a Pettus sand test was announced for Duval County, as Henshaw Brothers prepared to spud 1 C. Gonzales, located about 9 miles northwest of Premont in the El Senor de la Garrera grant. I. K. Howeth 1 Kreis, a wildcat which has been testing for the past several weeks, reperforated casing at 3,249-58 ft., and was completed for an initial production of 8 to 10 bbl. of oil per day pumping.

An important extension was apparently recorded for the North Rincon field, Starr County, as Sun 1 Coates recovered 680 ft. of oil, 60 ft. of mud and 10 ft. of water on a 5-minute drill-stem test at 4,361-69 ft. Working pressure built up to 93 lb. At the close of the week the well was drilling ahead in sandy shale below 4,580 ft. Location is in the C.C.S.D.&R.G.N.G. Survey 515, about 3,500 ft. west of the company's 1 Saenz, and northeast of the discovery well.

SOUTHWEST TEXAS COMPLETIONS
LOWER GULF COAST DISTRICT

Jim Wells County

East Premont field: Magnolia 14 Seeligson, 264 bbl., 11/64-in. choke, perf. casing 6,695-97 ft., T.D. 6,802 ft.

Wade City field: Arkansas Fuel Oil Co. 2 Schreade, 87 bbl., 4/7-in. choke, perf. casing 4,922-24 ft., T.D. 4,941 ft.

Nueces County

Robstown field: Jay Simmons 1 Meese, dry, T.D. 5,362 ft.

Refugio County

Refugio field: CE-Beth Oil Co. 6-B Mitchell, 22 bbl., 9/64-in. choke, perf. casing 6,282-90 ft., T.D. 6,855 ft.

LAREDO DISTRICT

Duval County

Casa Blanca field: Magnolia 10 Duval County Ranch Co., 75 bbl., jetting, T.D. 1,550 ft.

Jim Hogg County

Colorado field: V. E. Neuhaus 7-C Trevino, 318 bbl., ¼-in. choke, sand 2,963-76 ft., T.D.
Sun 15 Thaxton, 221 bbl., 4/7-in. choke, sand 3,017-28 ft., T.D.
Wildcat: Jay Simmons 1 Palacios, dry, T.D. 2,958 ft.

Starr County

Yzaguirre field: Complete Oil Wells Service Co. 2 Yzaguirre, dry, T.D. 5,400 ft.

Zapata County

Glen field: Transwestern 2-B Yeager-Stroman, 23 bbl., pumping, sand 2,187-92 ft., T.D.

SAN ANTONIO DISTRICT

Bexar County

La Coste field: W. M. Peacock et al 1 fee, 2 bbl., pumping, T.D. 553 ft.

SOUTHWEST TEXAS DRILLING REPORT

Aransas County

Continental 3 St. Charles, 1,800 ft. E of discovery well

(Continued on Page 87)

North Louisiana-Arkansas

(Continued from Page 62)

Prairie County

Hazen Oil Co. 1 Fidelity Mutual life Ins. Co. .... NE NE SW 16-2n-6w
S.D. 550 ft.

Saline County

Tedford Drlg. Co. 1 Williams .... NE SE 31-3s-15w
S.D. 680 ft.

St. Francis County

U. S. Oil Corp. 1 Wilford ..... SE NE 29-4n-1w
Stuck drill stem 2,031 ft.

Woodruff County

John N. Watkins 1 S. Nathan .. NE NE SW 18-5n-2w
S.D. 1,732 ft.

EAST TEXAS BORDER

A new gas field in Shelby County was established as Superior Oil Co. completed 4 Pickering Lumber Co., W. J. Crane Survey, for an estimated potential production of 8,000,000 cu. ft. The test had been drilled to 6,085 ft. with a gas show in the Paluxy at 3,678-85 ft., and a slight gas show in porous lime at 5,653 ft. Operators plugged back and set casing at 3,750 ft., perforated the Paluxy formation and completed the well. They are reported planning to deepen another wildcat drilled in the general area, 1 Pickering.

Gas development marked the week in three East Texas border counties, with two new wells completed in the Waskom field of Harrison County, and a ¾-mile northwest extension to the Carthage area of Panola County, by Turner & Smith, completing 2 Panola Development Co.

EAST TEXAS BORDER COMPLETIONS

Waskom—Harrison County

Arkansas Louisiana Gas Co. 1-B Davis, R. H. Adams Sur., perf. casing 5,870-6,148 ft., potential 21,893,000 cu. ft. gas.
Arkansas Louisiana Gas Co. 1 Scott, S. Dickerson Sur., perf. casing 5,848-6,068 ft., potential 4,432,000 cu. ft. gas.

Carthage—Panola County

Turner & Smith 2 Panola Dev. Co., George Gillespie Sur., gas well, no gage. T.D. 5,040 ft., 7-in. casing 5,016 ft., gas sand 5,023-29 ft.

Wildcat—Shelby County

Superior Oil Co. 4 Pickering Lumber Co., W. J. Crane Sur., T.D. 6,085 ft., P.B. and set 5-in. casing 3,750 ft., perf. gas sand 3,6787-85 ft., est. potential 8,000,000 cu. ft. gas, Paluxy sand.

EAST TEXAS BORDER DRILLING REPORT

Marion County

J. D. Parsons 1 T. W. Hook, Alexander Albright Sur., T.D. 5,006 ft., preparing to deepen.
P. L. Withers et al 1 T. G. Allen, Robert Potter Sur., S.D. 1,026 f.

San Augustine County

Roper & Todd 1 Long Bell Lumber Co., Nathaniel Hyden Sur., rigging up.

Two Pecos County Wildcats Testing for Production

By R. MARNE SANFORD

MIDLAND, Tex., Jan. 6.—Two wildcat tests, one in in the recently opened deep Abell area and one 9 miles west of the deep Apco field, both in Pecos County, were testing as the week closed and indicating new discoveries. Throughout the entire West Texas area the year's wildcatting program started off at a rapid clip with a total of six new tests staked, two in Ward County and one each in Ector, Howard, Gaines and Yoakum counties.

In the Abell Ordovician area of northern Pecos County Magnolia 1 Markley, ¾ mile north of the discovery well, was testing for production from a shallow Permian zone at the close of the week. Started as a deep Mississippian lime test to the level opened by the discovery well, saturation was encountered from 3,447-62 ft. in lime. The hole was bottomed at 3,535 ft. and 9⅝-in. casing was cemented at that depth. Through perforations from 3,445-48½ ft. the zone showed some oil, mostly oil load, and some water. Swabbing was under way at last report. Should commercial production fail the hole will be carried ahead to the deep Mississippian lime.

A wildcat 9 miles west of the Apco (Ellenburger lime) field in northern Pecos County was testing for completion from the Ellenburger lime. It is Culbertson & Irwin, Inc. 1 Mary Heiner, Section 589, G.C.&S.F. Survey. With 7-in. casing set at 5,130 ft. and 2-in. tubing run to 5,187 ft., swabbing tests were under way as the week closed. The Ellenburger was topped at 5,128 ft. and in coring from 4,170 to 5,186 ft. a 3-ft. core was recovered showing broken saturation in dolomitic lime, however, a 45-minute drill-stem test of the section showed only 10 ft. of mud.

Soma Area Active

The Soma or Noelka area of extreme western Crockett County, opened early in the year by the Soma Oil & Gas Syndicate 1 Noelke, is set for new development as three locations were staked the past week in the now nine-well field and also a ½-mile south outpost was preparing to drill in for completion.

The south outpost is Moore Exploration and Olson Drilling Co. 2 Noelke, 495 ft. from the north and 2,548 ft. from the west lines of Section 77 (formerly called Section 55), Block G. G., T. W. Carter Survey, almost directly south of the discovery well. The well blew out after topping gas in the Yates sand at 1,185 ft., however, it has been brought under control, casing cemented, and preparations were under way to drill in at the close of the week. If completed this will be one of the major extensions for the yet undefined field.

New tests for the area included two by Silas Pittman and George Rankin, one the 2-D Noelke, 330 ft. out of the SE cor. NW SE Section 30, Block G.G., H.E.& W.T. Survey, and the other 1 G. S. Bouscaren, 330 ft. out of the NW cor. NW SE Section 25, Block G.G., H.E.&W.T. Survey.

The third location for the field is J. T. Holmes 1 Noelke, 330 ft. out of the SE cor. NE Section 30, Block G.G., H.E.&W.T. Survey.

New Exploratory Tests

In the recently opened deep Silurian field in Ward County, Gulf Oil Corp., discoverer of the field, has staked a second test. It is 6 Wristen Brothers, C W¼ E¼ Section 18, Block 5, H.&T.C. Survey, approximately 1,000 ft. east of its No. 5 discovery well. It is contracted to 7,500 ft. to test the Silurian lime.

In the Bird Hayes gas field of central Ward County Roeser & Pendleton, Inc., Fort Worth, and Merry Brothers & Perini, Abilene, have staked 1 Bird Hayes, 467 ft. from the SE and SW lines of Section 164, Block 34, H.&T.C. Survey, about ¼ mile north of the discovery well. It is contracted to 5,200 ft. to test the Delaware sand found productive of gas in the initial test for the area.

In Ector County Cities Service Oil Co. has staked a mile southwest outpost to the South Addis field. It is 1 F. V. Addis, SE SE SE Section 34, Block 43, Township 2s, T.&P. Survey. It is only about ⅛ mile northeast of the old R. A. Westbrook 2 Addis which was quit as dry at 4,204 ft.

In Howard County Cosden Petroleum Corp. has staked location for a nitrogen well. It is No. 1 fee, 450 ft. from the north and 275 ft. from the east lines of Section 47, Block 32, Township 1n, T.&P. Survey, near the center of the company's tank farm 4 miles west of Big Spring. It is contracted to 1,400 ft. and will primarily seek the nitrogen pocket found several years ago by a wildcat test. The air is expected to be used for power on the tank farm.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Crane County

McElroy field: Gulf 234 McElroy, 987 bbl., open casing and tubing, 710-qt. shot, 2,765-2,969 ft.
Waddell field: Gulf 35 Waddell, 32 bbl. oil and 3 bbl. water, pumping, 480-qt. shot, 3,250-3,435 ft., P.B. 3,677 ft., T.D.
Tubb field: Humble 48 Tubb, 3,760 bbl., 2½-in. casing outlet, 4,000 gal. acid, 4,320-4,400 ft.

Ector County

North Cowden field: Barnsdall 21 Smith, 849 bbl., ¾-in. choke, 320-qt. shot, 4,170-4,330 ft.
Foster field: Octogan Oil 1 T. & P. Land Trust, 318 bbl., ¾-in. choke, 3,500 gal. acid and 292-qt. shot, 4,040-4,180 ft.
Duro field discovery well: Forest Development 1 Brad-

(Continued on Page 70)

SUMMARY OF COMPLETIONS

Southern West Texas

	No.	Bbl.	Footage
Oil wells: Ector County	4	3,070	16,979
Crane County	3	4,779	11,046
White & Baker field	2	162	3,963
McCamey field	2	345	5,058
Estes field	2	909	5,551
Other fields	3	643	7,831
Dry holes: Duro field	1	.....	4,419
Total	17	.....	54,838

Northern West Texas

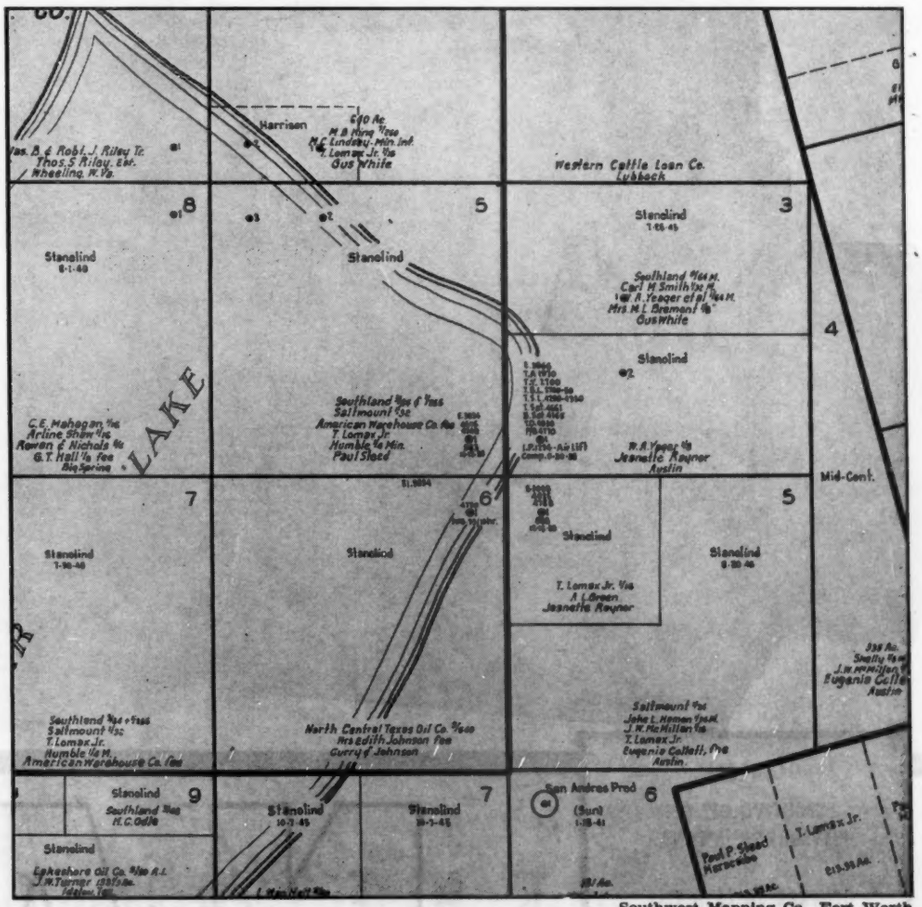
Oil wells: Slaughter field	4	2,207	20,138
Seminole field	7	3,868	37,109
Sharon field	2	395	4,163
Wasson field	3	2,948	15,790
Total	16	.....	77,200

Southeast New Mexico

	No.	Bbl.	Footage
Oil wells: Eddy County	2	100	7,498
Lea County	9	3,385	36,160
Total	11	.....	43,658

Texas Panhandle

	No.	Bbl.	Footage
Oil wells: Fields	3	897	9,162
Dry holes: Shamrock field	1	.....	2,278
Total	4	.....	11,440

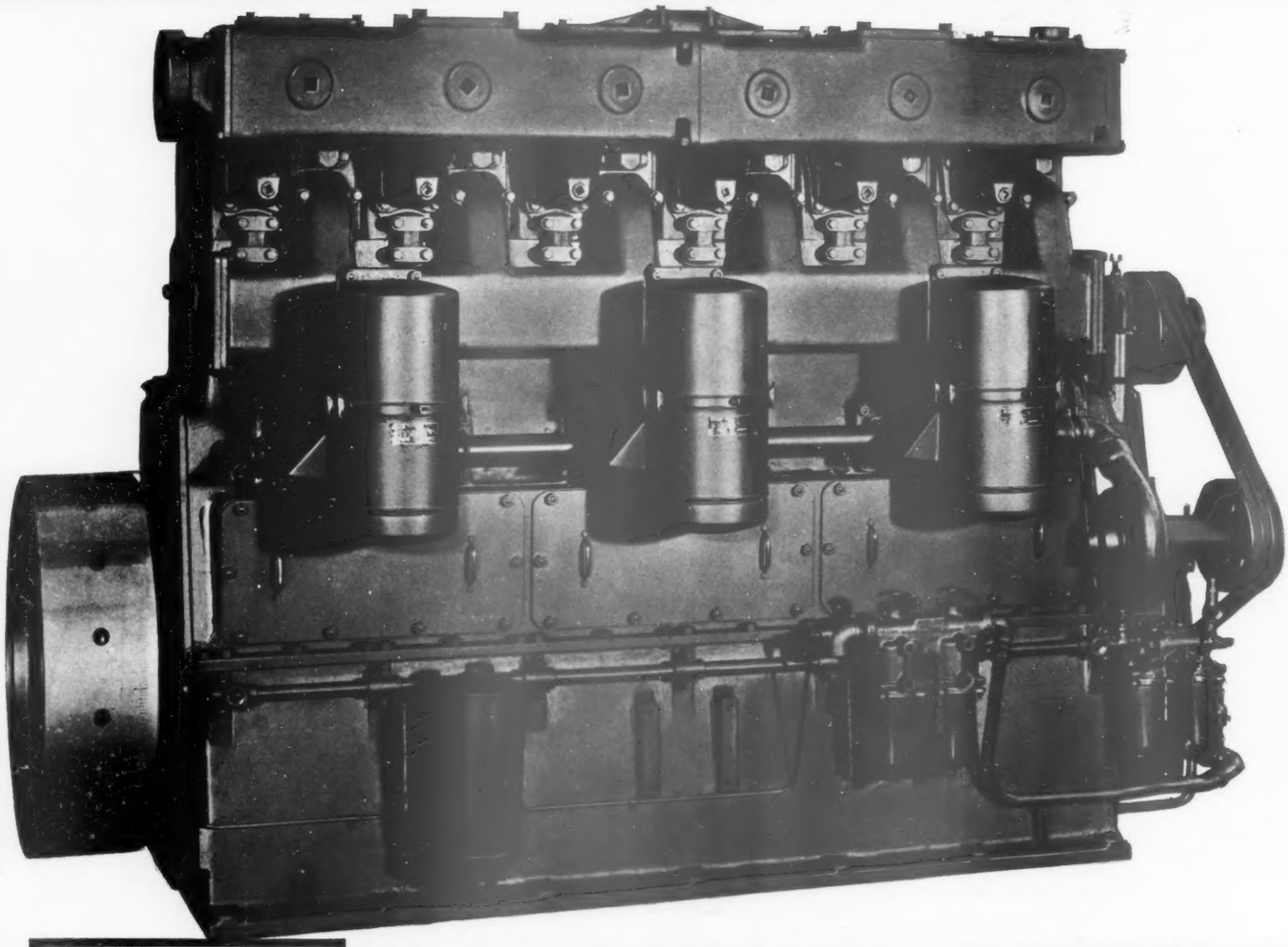


Southwest Mapping Co., Fort Worth

The Cedar Lake field in Gaines County is scheduled for new development on the south end as work starts toward the drilling of two recent farmouts by Sun Oil Co. to the San Andres Production Co. of Lubbock. The firm's first test to be drilled is 1 Johnson, about a mile south of production in the 11-well field

Superior DIESELS

FOR PIPE LINE • GENERATOR • ROTARY RIG SERVICE



DOMESTIC

EXECUTIVE OFFICES
PITTSBURGH, PENNA.

•

GENERAL SALES OFFICE
TOLEDO, OHIO

•

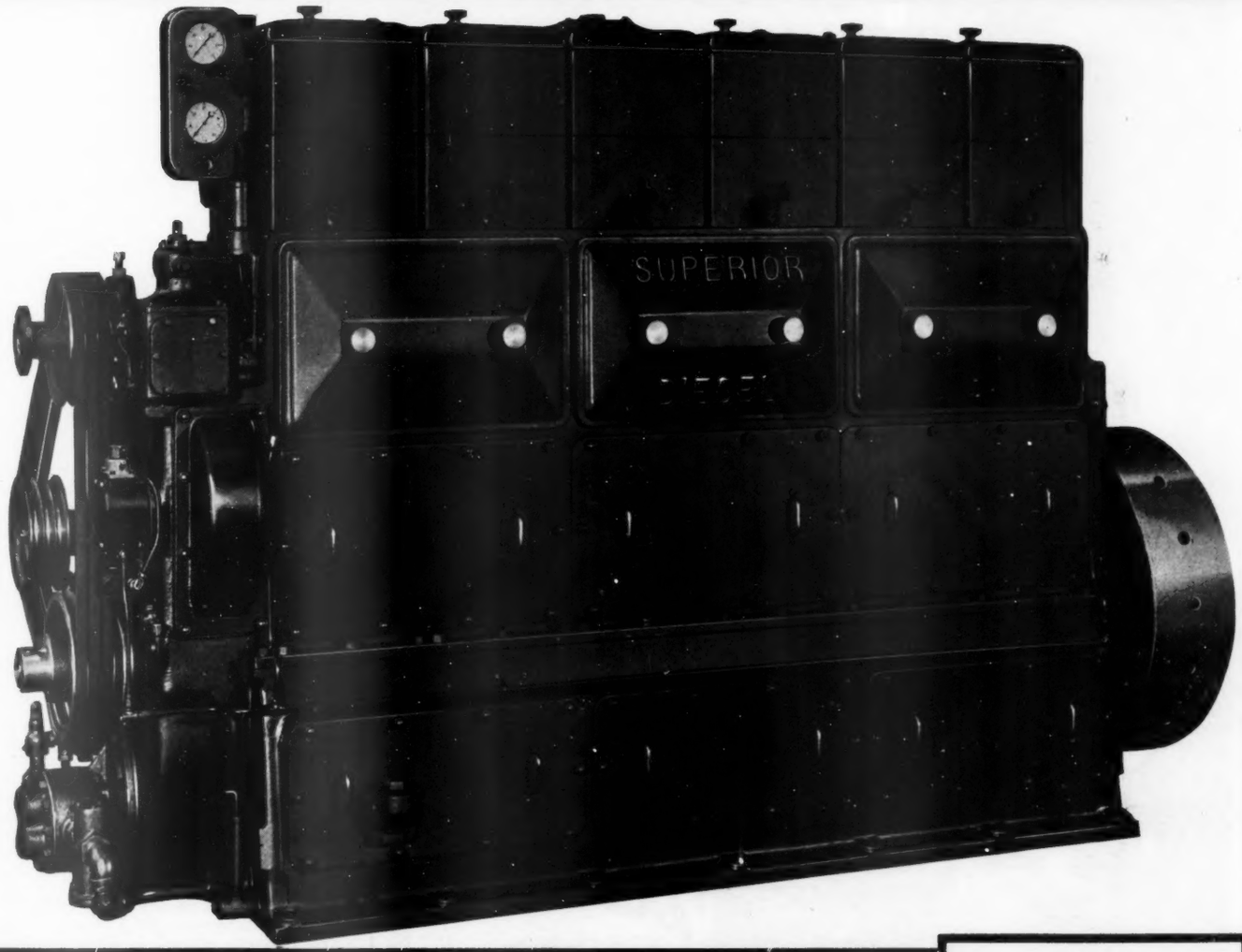
DIVISION OFFICES
FT. WORTH, TEX. • TULSA, OKLA.
TORRANCE, CALIF.

THE NATIONAL

● Slow, Medium and High Speed Models
● 14 Combinations of Bore and Stroke
● The Horsepower Range is 25 to 900
● They are Convertible to Gas Operation

The Type ORD, 8" x 9½" — PRD, 8½" x 9½" — PTD, 8½" x 10½" Convertible Diesels as illustrated are built in 6 and 8 cylinder models for speeds up to 900 R.P.M. Same model is built as Type QTG, 9" x 10½", straight gas engine.

These engines are well suited for driving centrifugal pipe line pumps through speed increasers, heavy rotary drilling rigs and direct-connected generator service.



SUPPLY COMPANY

EXPORT

THE NATIONAL SUPPLY CORPORATION
30 ROCKEFELLER PLAZA
NEW YORK, N. Y. . . . U. S. A.

•

RIVER PLATE HOUSE
12 SO. PLACE, LONDON, E. C. 2
LIMITED LIABILITY

•

PLOESTI, ROUMANIA

•

West Texas Fields

(Continued from Page 67)

ley, SE SE Sec. 18, Blk. 43, Twp. 3s, T.&P. Sur., 162 bbl., pumping, daily, 10,000 gal. acid, 4,330-62 ft., P.B. 4,410 ft., T.D., top anhydrite 1,690 ft., Yates sand 2,870 ft., Yates frosted quartz grains 2,900 ft., brown lime 3,560 ft., solid lime 3,795 ft.
Goldsmith field: Gulf 327 Goldsmith, 1,320 bbl., open tubing, 4,000 gal. acid, 4,171-4,241 ft.
Gulf 330 Goldsmith, 583 bbl., open tubing, 1,100 gal. acid, 4,158-4,228 ft.

Pecos County

White & Baker field: Burleson & Walker 2 White & Baker, 51 bbl., tubing, natural, 1,900-40 ft.
J. M. Odam 1 White & Baker, 111 bbl., ⅛-in. choke, 40-qt. shot, 1,978-2,023 ft.
Masterson field: Childress Royalty Co. 13 Masterson 31 bbl., pumping, 40-qt. shot, 1,480-1,515 ft.

Upton County

McCamey field: Gulf 18 Sherk, 51 bbl. oil and 12 bbl. water, 2,000 gal. acid and 308-qt. shot, 2,620-2,744 ft., P.B. 2,758 ft.
Texas Pacific Coal & Oil 13-E Lane, 294 bbl., pumping, 2,000 gal. acid, 2,304-2,300 ft.

Ward County

Estes field: Gulf 152 O'Brien, 616 bbl., open casing, natural, 2,683-2,774 ft.
Gulf 156 O'Brien, 293 bbl., open casing, 407-qt. shot, 2,608-2,777 ft.
South Magnolia-Sealy field: Magnolia 3-41 Sealy, 416 bbl., 1-in. choke, natural, 2,907-21 ft.

Winkler County

Keystone field: J. R. Sharp 2 Little-Jenkins, 196 bbl., ¾-in. choke, 240-qt. shot, 3,304-95 ft.

SOUTHERN WEST TEXAS WILDCAT REPORT

Crane County

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 8,928 ft.

Crockett County

Moore & Olson 2 Noelke, 495 ft. from N and 2,548 ft. from W lines Sec. 77, Blk. G.G., T. W. Carter Sur., gas blowout at 1,185 ft., set 5½-in. casing, prep. drill plug and try for completion.

Culberson County

Cecil Cothrun 1 Casey-Rounsoville, Sec. 7, Blk. 104, P.S.L. Sur., water from 1,012-20 ft., T.D. 1,050 ft., last report.

Ector County

Stanolind 1-B W. F. Cowden, SE W½ Sec. 12, Blk. 44, Twp. 1n, T.&P. Sur., deep Holt lime test, 7-in. 4,244 ft., drilling 4,390 ft. with heavy rig.
Cities Service 1 F. V. Addis, SW SE Sec. 34, Blk. 43, Twp. 2s, T.&P. Sur., cellar and pits.
Forest Development Corp. 1-B W. P. Edwards, 1,787 ft. from N and 2,174 ft. from W lines Sec. 30, Blk. 43, Twp. 3s, T.&P. Sur., 10¾-in. at 251 ft., drilling 2,200 ft.

Loving County

H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., S.D. 1,690 ft.
Sloan & Zook 1 T.&P. Trust, SW SE Sec. 37, Blk. 56, Twp. 1s, T.&P. Sur., 3¾ mi. NE of Tunstill gas well, drilling 1,400 ft.

Menard County

Harry Baldwin 1 J. A. Leggett, 760 ft. from W and 900 ft. from S lines, Sec. 1, B.S.&F. Sur., S.D. 575 ft. (corrected depth).

Pecos County

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.&S.F. Sur., Ordovician wildcat, top Ellenburger lime 5,128 ft., set casing 5,130 ft., T.D. 5,188 ft., show oil in upper Ellenburger lime, testing.
S. D. Pattillo 1 Hoffman, SE NW Sec. 6, Blk. 141, T.&St.L. Sur., 2,000-ft. test, S.D. 1,360 ft. (corrected).
Kean & Beesley 1 Slaughter, 2,200 ft. from N and 440 ft. from E lines Sec. 30, Blk. 129, T.&St.L. Sur., first report.

Presidio County

Wilcox 1 Conring, Sec. 102, Blk. 4, H.&T.C. Sur., running 10¾-in. casing at 1,038 ft., S.D. 1,040 ft.
Wilcox 2 Jones-Coffield, Sec. 38, Blk. 34, H.&T.C. Sur., P.B. to 2,369 ft. from 2,399 ft., preparing to P.B. again, last report.

Reeves County

J. B. Dunnigan 1 A. B. Burchard, SW Sec. 7, Blk. 58, P.S.L. Sur., Delaware test, location.
Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., T.D. 1,805 ft., last report.

Schleicher County

Harold B. Opp 1 Jackson, Sec. 41, Blk. L.L., T.C. Sur., drilling 5,430 ft.

Sutton County

S. B. Roberts 1 Geo. Allison, NW NE Sec. 44, Blk. K., G.H.&S.A. Sur.
Domain 1 G. S. Allison, SW NE Sec. 91, Blk. 9, T.W. N.G. Sur., Ellenburger lime test, S.D. 1,098 ft., last report.
S. B. Roberts 1 Allison, NW NE Sec. 44, G.H.&S.A. Sur., preparing ream 310 ft., last report.

Terrell County

Texas Consolidated Oil 1 Holmes, NE NE Sec. 14, Blk. 2-A G.H.&S.A. Sur., 3,600-ft. test.
H. H. Sides 1 Rose, Sec. 15, Blk. 148, T.&St.L. Sur., rigging up spudder.
C. M. Thomasson 3 Bates-Graham, 600 ft. from N and 2,490 ft. from W lines Sec. 30, Blk. 1, I.&G.N. Sur., drilling 252 ft.

Ward County

Fitzpatrick & Slack 1 Wilson, Sec. 145, Blk. 34, H.& T.C. Sur., 1½ mi. SE of discovery well, tools lost in hole at about 4,700 ft., S.D.O.
Gulf 6 Wristen, 1,997 ft. from SE and 1,989 ft. from NE lines Sec. 18, Blk. 5, H.&T.C. Sur., deep Silurian test, first report.
Roeser & Pendleton, Inc., and Merry Bros. & Perini 1 Bird Hayes, 467 ft. from SE and SW lines Sec. 164, Blk. 34, H.&T.C. Sur., ¼ mi. N of discovery gas well, location, contract depth 5,200 ft. to Delaware sand.

NORTHERN WEST TEXAS

Early in the development of Gaines County's Cedar Lake field 2 years ago a 2½-mile north outpost producer was drilled by Stanolind Oil & Gas Co. which was completed for only 11 bbl. of oil daily, pumping. Since the completion of this small outpost the majority of the development in the field during the past year has been close in, resulted in only one location extensions. The past week two tracts were farmed out to the San Andres Production Co. of Lubbock by Sun Oil Co. and a location has already been staked on one of the tracts. The site is about a mile south of production in the field and is 1-A Johnson, NW cor. Section 6, Block 30-C, P.S.L. Survey. San Andres Production Co.'s other farmout tract is about ½ mile southwest of the one embracing the new location and will be developed following the completion of a commercial well on the north tract.

A new wildcat outpost has been staked to the Waples-Platter area just northeast of the Bennett sector of the large Wasson field in Yoakum County. It is George Livermore 1 Ernest Ownby, NE cor. Section 502, Block D, Gibson Survey, about 3 miles north and ¾ mile east of the Livermore (formerly Sloan & Zook and T. N. Sloan) 1 Waples-Platter, first flowing producer and second well for the area completed several months ago. The new test has been started and is drilling below 1,340 ft.

NORTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Cochran County

Slaughter field: Magnolia 2-B Mallett, 491 bbl., 1-in. choke, 10,500 gal. acid, 4,966-96 ft.
Texas 1-H Mallett, 184 bbl., 49 per cent water, 6,000 gal. acid, 5,042-98 ft.

Gaines County

Seminole field: Amerada 7 Mann, 243 bbl., ½-in. choke, 7,000 gal. acid, 5,058-5,245 ft.
Amerada 8 Mann, 734 bbl., ½-in. choke, natural, 5,085-5,259 ft.
Amerada 2-A Matthews, 639 bbl., ½-in. choke, natural, 5,150-5,376 ft.
Amerada 7-A Riley, 683 bbl., ½-in. choke, natural, 5,058-5,300 ft.
Amerada 3 Turlin, 485 bbl., ½-in. choke, natural, 5,153-5,280 ft.

The Powell Line is COMPLETE

• • • FOR EVERY SERVICE IN THE PETROLEUM AND OIL REFINING INDUSTRY

FOR INSTANCE— HERE'S ONE OF SEVERAL POWELL VALVES SPECIFICALLY SUITED TO Refining SERVICE

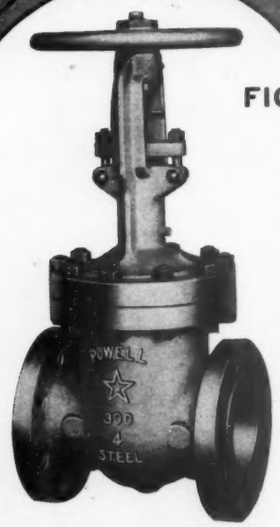


FIG. 3003—CAST STEEL

As in all Powell Cast Steel products, here is a valve of improved design, assuring long, safe, and dependable service. All vital working parts are produced to gauge, are interchangeable, and of equal wearing quality. Guide-ways for wedges in gate valves are accurately machined to given dimensions; seat faces are machined in direct relation to these guide-ways; special form of thread of more than ample length holds rings securely; special attention to pitch of threaded sections on stems; bonnets designed with same wall section as bodies; non-corrosive packing glands... these and other features, many entirely exclusive with Powell, account for the better performance you can count on from this particular valve in Refining service.

Remember— There's more to POWELL QUALITY than meets the BUYER'S EYE!

Follow our series of monthly page advertisements revealing the hidden qualities that exist in all POWELL products

POWELL VALVES

THE WM. POWELL CO. • CINCINNATI, OHIO

Humble 1 Matthews, 420 bbl., ½-in. choke, natural, 5,082-5,317 ft.
Ohio 5 Gibbs, 664 bbl., ½-in. choke, natural, 5,160-5,332 ft.

Hockley County

Slaughter field: Magnolia 2-F Mallett, 378 bbl., 1-in. choke, 8,000 gal. acid, 4,945-90 ft.
Stanolind 9-A Slaughter, 1,154 bbl., 1½-in. choke, 9,000 gal. acid, 4,981-5,054 ft.

Mitchell County

Sharon Extension field: Cree & Hoover 1 Strain, 196 bbl., pumping, 810-qt. shot, 1,570-1,688 ft.

Scurry County

Sharon field: Magnolia 3 Sterling, 199 bbl., pumping, 920-qt. shot, 2,260-2,475 ft.

Yoakum County

Wasson field: Don Danvers 3 Bennett, 789 bbl., 1½-in. choke, 10,000 gal. acid, 5,048-5,270 ft.
Sinclair Prairie 1 Willard, 1,053 bbl., 1-in. choke, 6,500 gal. acid, 4,990-5,270 ft.
Texas Pacific Coal & Oil 6 Hearne, 1,106 bbl., open tubing, 10,000 gal. acid, 5,147-5,250 ft.

NORTHERN WEST TEXAS WILDCAT REPORT

Andrews County

Phillips 1-222 Embar, SE SE Sec. 6, Blk. 44, Twp. 1n, T.&P. Sur., preparing to drill.
Phillips 1-223 Embar, NE SW Sec. 7, Blk. 44, Twp. 2n, T.&P. Sur., preparing to drill.
Phillips 1 University-Drews, NW NE Sec. 32, Blk. 10, University Lands Sur., drilling 4,553 ft.
Phillips 2 Embar, NE SE Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur., ⅜ mile N of Embar, drilling 5,145 ft.
Furham Pet. 1 Lockhart-Brown, Sec. 24, Blk. 42-A, P.S.L. Sur., top solid lime 4,155 ft., T.D. 4,700 ft., S.D.O., sulfur water.

Cochran County

Rhodes and Atlantic 1 Dean, C NE Tract 4, Lge. 89, Lipscomb Co. School Lands, T.D. 5,150 ft., P.B. 5,112 ft., treated with 1,000 gal. acid, shot 210 qt., still testing.

Gaines County

Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., logged new pay about 6,610 ft., tight well, believed drilling about 9,340 ft., application filed to drill to 10,000 ft.

Mitchell County

Peck & Croft 1 Jack Smith, 2,173 ft. from N and W lines Sec. 19, Blk. 26, T.&P. Sur., location.

Terry County

Gulf 4 Mallett, Sec. 4, Blk. X, P.S.L. Sur., SW of Slaughter field, T.D. P.B. 5,070 ft., swabbed 23½ bbl. fluid with scum of oil.

Yoakum County

George Livermore 1 Ownby, NE NE NE Sec. 502, Blk. D, Gibson Sur., Drilling 1,340 ft.

TEXAS PANHANDLE

AMARILLO, Tex., Jan. 6.—The past 2 weeks of holiday activity has considerably slowed work in the Texas Panhandle field, there being only four completions reported for the past week. Three new oil wells were reported, one each in the Skellytown, Stinnett and Borger fields and a failure was recorded in the Shamrock field of Wheeler County. Locations for the week totaled 10 to start the year off with increased activity.

TEXAS PANHANDLE COMPLETIONS

Carson County

Skellytown field: Cities Service 5 Magnolia, 161 bbl., pumping, 3,057-3,115 ft.

Hutchinson County

Stinnett field: McElroy Oil 8 Tomlinson, 550 bbl., pumping, 3,145-61 ft.
Borger field: Skell 10 Watkins, 186 bbl., pumping, 2,810-86 ft.

Wheeler County

Shamrock field: Pendleton & Vaughn 2 E. E. Volland, dry at 2,278 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Jan. 6.—The Maljamar field of Lea County led the activity in the Southeast New Mexico area during the week past, reporting a total of seven new completions, all for oil wells. Completions in the entire district totaled 11, two being in Eddy County and two in the Vacuum field of Lea County.

There were six new locations staked in the district for the week, two in Eddy County and four in Lea County, two of the latter being in the active Maljamar field.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

Robinson field: Dominion Oil & Gas 4-A Johnson, C SE SW 35-16-31, 55 bbl., ½-in. choke, 3,380-3,873 ft.
Shugart field: Carper, Keohane & Saunders 2-A Kinkle, 34-18-31, 45 bbl., 1/32-in. choke, 3,398-3,625 ft.

Lea County

Maljamar field: Maljamar Oil & Gas 5-B Baish, C SE SE 21-17-32, 520 bbl., open casing, natural 3,935-50 ft.
Maljamar Oil & Gas 6-B Baish, C SW SE 21-17-32, 200 bbl., open tubing, natural, 4,045-94 ft.
Maljamar Oil & Gas 4-B Baish, C SW SW 22-17-32, 350 bbl., ¾-in. choke, shot 3,945-87 ft.
Williams & Cockburn 7-A Miller, 23-17-32, 153 bbl., 7½ hr., open tubing, shot, 3,840-4,035 ft.
Fair & Pope 1-B Johnson, C NW SE 26-17-32, 65 bbl. in 2 hr., open tubing, shot, 4,105-4,280 ft.
Cockburn 28-B Baish, C SE SE 28-17-32, 474 bbl., open tubing, shot, 3,950-4,005 ft.
Cockburn 31-B Baish, C SW SW 28-17-32, 192 bbl., open tubing, shot, 3,940-70 ft.
Vacuum field: Magnolia 4-P State, 26-17-35, 55 bbl., pumping, shot, 4,450-4,560 ft.
Amerada 1-J.A. State, NE SE NW 27-26-37, 259 bbl. in 18 hr., ½-in. choke, shot, 3,227-79 ft.

SOUTHEAST NEW MEXICO WILDCAT REPORT

Chaves County

L. E. Elliott 1 State ..... NW NE 16-11-31
Drilling 25 ft.
Roxana Oil 1 Maull ..... NE NW 11-12-25
S.D. 460 ft.
A. F. Pierce 1 Franks ..... SE NW NW 17-9-25
7-in. at 425 ft., S.D., casing 894 ft.
Helmes-Martin 1 Stephens ..... C NW NE 22-15-29
Old well drilling deeper, 7-in. at 1,848 ft., show oil 3,112-30 ft., S.D. 3,165 ft.
H. Steinberger 1 Headley ..... NW SW 26-14s-29e
Est. 500,000 cu. ft. gas 1,826-28 ft., show oil 2,885-95 ft., show oil, 3,080-3,140 ft., drilling 3,480 ft.
R. I. Wilson 1 L. B. Brown ..... C NW SW 29-11-23
Drilling 125 ft.

Eddy County

A. & M. Pet. 2 State ..... NW SE 15-21-27
Drilling 526 ft.
Mac T. Anderson 1 Brainard ..... NE NE 28-18-27
Drilling 1,835 ft.
Bedingfield & Walker 1 Seale ..... SE SE SE 10-20-27
Drilling 1,500 ft.
Jack Harris Josey ..... SW SE 19-20-23
T.D. 643 ft.
Jones & Yates 1 Everest ..... NE SE 15-18-26
Show oil 1,215-18 ft., 1,448-52 ft., show gas 1,549-50 ft., show oil 1,782-94 ft., drilling 1,984 ft.
S. P. Yates 1 Taylor-Ross ..... NW SW 22-19-25
Drilling 826 ft.
Fulton 1 Johnson ..... NW SE 22-19-27
T.D. 1,849 ft., P.B. 1,645 ft., 230-qt. shot 1,752-1,645 ft., filled 400 ft. with oil and water after being cleaned out, 5⅛-in. casing at 1,442 ft., testing.
Truett & Tailmadge 1 Rudahl ..... NE SE 2-20-24
12½-in. 302 ft., drilling 1,705 ft.
Dooley & Haynes 1 Martin ..... SE NW 9-18-25
5½-in. at 975 ft., S.D. 1,000 ft.
Trojan 1 Grant ..... SW NE 33-20-25
Set 8¼-in. at 1,300 ft., fishing tools 2,100 ft.
Clark & LaNeve 1 Boulter ..... SE NW 28-19-27
Show oil 1,126 ft., S.D. 1,250 ft.
Fred Turner 1 DeVito 12-23-35
Show gas 1,100-05 ft., 7-in. 1,500 ft., S.D. 1,670 ft.

Otero County

Otero Oil 1 State ..... SE NW 5-22-10
Reaming 8¼-in. at 1,190 ft., T.D. 1,240 ft.
R. H. Ernest 1 Located Land Co. ..... SE SE 20-25-7
T.D. 3,843 ft.

CHOKES
are not Always
in the Wells . . .

CHOKES are indispensable in the proper production of many wells.
Just the opposite is true when production and development activities are choked by lack of needed finances.

To the fast-moving oil industry an understanding bank is essential. It is the constant aim of the Republic to meet the variety of needs of the oil industry as they arise.

REPUBLIC NATIONAL BANK
OF DALLAS
MEMBER FEDERAL DEPOSIT INSURANCE CORP
ONE OF THE NATION'S 100 LARGEST BANKS

Wildcat in Taft Area Testing Temblor Formation

By

L. P. STOCKMAN

LOS ANGELES, Calif., Jan. 6.—During the early part of the week one of the biggest movements of its kind, four freighters, left Los Angeles Harbor for Japan. Two of these freighters were on their maiden voyage and they were all carrying cargoes of drummed gasoline and oil. The ships were put into the harbor over the week end for bunkers after loading the cargoes in a Gulf of Mexico port. They are owned by the Lykes Brothers Shipping Co. of New Orleans. The James Lykes and Reuben Tipton, both C-1-type vessels, are on their first voyage since being commissioned on the Atlantic Coast. There was approximately 1,740,000 gal. of gasoline in 33,500 drums aboard the Aquarius, one of the older Lykes Brothers freighters. This was reported to be of a very low grade and, unless doped, impossible to use for high-powered airplanes. The James Lykes carried a full cargo of lubricating oil; and, according to reports, the fourth Lykes Brothers ship to enter the harbor, the Winston Salem, caried a full cargo of gasoline and lubricating oil.

SUMMARY OF COMPLETIONS

California

	No.	Bbl.	Footage
Oil wells: Los Angeles Basin	9	2,395	43,005
San Joaquin Valley	10	11,105	81,648
Coastal fields	3	5,792	17,421
Total	22		142,074

LOS ANGELES BASIN COMPLETIONS

Huntington Beach Field

Signal O. & G. 16-A Bolsa 34-5s-11w
Flowed 650 bbl., 28 gravity, 1.9 per cent cut, 50,000 cu. ft. gas; 17/64-in. bean; shut-in pressures 200/500 lb.; elev. 20 ft.; T.D. 5,060 ft.; P.B. 4,766 ft.; 8⅝-in. water string 4,256 ft.; 527 ft. 6⅝-in. liner 4,761 ft.; perf. 4,255-4,761 ft.; 4,656 ft. 2½-in. tubing. Completed in Bolsa zone on compressor, 25 days' drilling time. Orange County.

Termo Co. 6 fee 10-6s-11w
Pumped 153 bbl., 25.3 gravity, 0.1 per cent cut; elev. 50 ft.; T.D. 5,255 ft.; 8⅝-in. water string 4,930 ft.; 348 ft. 6⅝-in. liner 5,255 ft.; 6⅝-in. protection string 4,907 ft. on top of liner; perf. 4,941-5,255 ft.; 4,848 ft. 2½-in. tubing. Completed beneath Huntington Beach submerged tidelands by directional drilling, 56 days' drilling time. Orange County.

Long Beach Field

Hilldon Oil Co. 4 Flood Control 13-4s-13w
Pumped 195 bbl., 25.6 gravity, 3.5 per cent cut; elev. 49 ft.; T.D. 5,419 ft.; 9-in. string 4,524 ft.; perf. 4,066-73 ft., 4,101-09 ft., 4,118-86 ft., 4,416-33 ft.; 935 ft. 4¾-in. liner 5,419 ft.; perf. 5,180-5,203 ft., 5,230-60 ft., 5,345-5,400 ft. Completed in Hilldon zone, 117 days' drilling time. Los Angeles County.

Texas Co. 17 Harlow Kent 19-4s-12w
Pumped 240 bbl., 23.6 gravity, 18 per cent cut; elev. 142 ft.; T.D. 2,933 ft.; 9⅝-in. water string 2,845 ft.; 180 ft. 5¾-in. gravel-packed liner 2,933 ft.; perf. 2,793-2,933 ft.; 2,737 ft. 3-in. tubing. Completed in Alamitos zone, 15 days' drilling time. Los Angeles County.

Potrero Field

Turf Oil Co. 2 Race Track 34-2s-14w
Flowed 210 bbl., 45.1 gravity, 0.1 per cent cut, 600,-000 cu. ft. gas; 16/64-in. bean; pressures 300/900 lb.; elev. 150 ft.; T.D. 5,804 ft.; P.B. 5,617 ft.; 7-in. oil string 5,745 ft.; perf. 5,510-70 ft.; 4,970 ft. 2½-in. tubing. Completed in second Potrero zone, 58 days' drilling time. Los Angeles County.

Rosecrans Field

L. C. and M. V. Kelly 5 McMillen 19-3s-13w
Flowed 175 bbl., 30.1 gravity, 10 per cent cut, 250,-000 cu. ft. gas; 17/64-in. bean; pressures 190/860 lb.; elev. 81 ft.; T.D. 7,903 ft.; 7-in. water string 7,462 ft.; 478 ft. 4¾-in. liner 7,903 ft.; perf. 7,462-7,903 ft.; 7,897 ft. 2½-in. tubing. Completed in O'Dea zone of Miocene age, 45 days' drilling time. Los Angeles County.

Wilmington Field

Sound Pet. Co. 2 Harbor 2-5s-13w
Pumped 187 bbl., 14.8 gravity, 0.6 per cent cut; elev. 9 ft.; T.D. 3,100 ft.; 8⅝-in. water string 2,710 ft.; 450 ft. 5½-in. gravel-packed liner 3,099 ft.; perf. 2,709-3,099 ft.; 2,760 ft. 2½-in. tubing. Completed in Ranger zone, 14 days' drilling time. Los Angeles County.

Union Pacific R. R. 157 fee 3-5s-13w
Flowed 460 bbl., 29.5 gravity, 0.6 per cent cut, 30,-000 cu. ft. gas; 48/64-in. bean; pressures 790/1,180 lb.; elev. 18 ft.; T.D. 3,965 ft.; bridge 3,750 ft.; 10¾-in. water string 2,533 ft.; 1,068 ft. 7-in. blank liner 3,958 ft.; perf. 3,428-3,505 ft., 3,530-86 ft., 3,636-95 ft., 3,808-59 ft., 3,884-3,957 ft.; 3,605 ft. 2½-in. tubing with lead-seal packer on bottom. Completed in Terminal zone, 69 days' drilling time. Los Angeles County.

Wonder Oil Co. 2-G Kupfer 32-4s-13w
Pumped 125 bbl., 14.6 gravity, 3 per cent cut; elev. 23 ft.; T.D. 3,566 ft.; 5½-in. water string 3,257 ft.; 330 ft. 4-in. liner 3,56 6ft.; 50-mesh perf. 3,266-3,566 ft.; 2,400 ft. 2½-in. tubing. Completed in Ranger zone. Originally spudded May 1, 1940, remained idle for several months. Los Angeles County.

LOS ANGELES BASIN OUTPOSTS

Dominguez Field

Union 79 Callender 32-3s-13w
Drilling 11,590 ft. Los Angeles County.

Long Beach Field

Union 19 L.B.C. 30-4s-12w
Drilling in sand and shale 9,970 ft. Los Angeles County.

LOS ANGELES BASIN WILDCATS

Dominguez-Gardena District

Wood-Mellon 1 Wood 31-3s-13w
T.D. 7,795 ft.; P.B. 2,400 ft.; redrilled 6,975 ft.; pumping water with trace of oil. Los Angeles County.

Inglewood District

Standard 3-1 L.A.I. 17-2s-14w
T.D. 8,780 ft.; fishing core barrel in hard Miocene sandy shale. Los Angeles County.

Pico District

Cal-Pico 1 Pico 7-2s-11w
T.D. 7,787 ft. in gray sand and shale; P.B. 6,000 ft.; may plug back farther and test showing around 5,900 ft. Los Angeles County.

DAILY AVERAGE PRODUCTION

Leading California Fields

	Jan. 4	Dec. 28
Coalinga	33,574	33,400
Kettleman North Dome	39,166	38,660
Midway-Sunset	42,121	52,650
Santa Maria Valley	17,532	19,550
Ventura Avenue	34,443	32,650
Dominguez	19,019	19,575
Huntington	25,216	26,825
Long Beach	39,994	41,425
Santa Fe Springs	25,067	25,025
Wilmington	80,034	80,470
Montebello	15,512	15,750
Total California	600,298	604,500

SAN JOAQUIN VALLEY

Much interest has been centered in the Taft area of San Joaquin Valley during the past week, where North American Oil Consolidated is drilling in the Williams area in the Miocene brown shale at a depth of 4,540 ft. This well is located in 28-32-23 and the work is rather slow due to the variations in formation, causing the drill to have a tendency to drift from the vertical. The company is drilling ahead rather carefully and is looking for production in the Temblor formation along the Spellacy anticline. There is no doubt as to why there is so much interest in this test, as the Temblor formation has been very productive in Belridge and Kettleman Hills.

Lost Hills came into the limelight during the past week when the Texas Co. successfully completed 2-28 Theta, in the southeastern part of the field in 2-26-20. The water shutoff was at 1,277 ft. and the well was completed at 1,301 ft. doing 35 bbl. of 12.7-gravity oil daily. The well was put on the pump early in December but the liner could not be pulled. It was on for about 10 hours and showed 20 per cent mud. There was considerable difficulty in completing this well because of much gas interference. Some difficulty is being experienced by the Pure Oil Co. in trying to bring in 2 Schwinn as its second producer in the Amerada area of the Coalinga Nose field. They have been swabbing it for several days and it occasionally spurts a little oil and mud. Some field men claim it is an upstructure edge well.

Kern Front

In the Kern Front district Western Mesa Oil Corp. is trying to bring its 5 KCL back on production. This well, located in 11-28-27, was redrilled and deepened from 1,733 ft. to 1,970 ft. There appears to be about 50 ft. of oil sand present which was not tested when the company first started the well to producing. In the Midway-Sunset, McKittrick and Lost Hills districts, the Reward Oil Co. transferred all of its oil holdings to the Tide Water Associated and the Southern Pacific Co. for a reported sum of $886,000. The Reward Oil Co. was a subsidiary of Tide Water Associated Oil Co. History of the Reward goes back to the days when Southern Pacific owned the Amalgamated and Pacific oil companies. The Pacific was taken over by the Standard Oil Co. of California and the Amalgamated was merged with the old Associated. The Reward Oil Co. was then held by the Associated with about 55 per cent of the stock and Southern Pacific with a fraction over 44 per cent. This new transaction is expected to liquidate the Reward setup, releasing producing leases and land and operating equipment.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge North Field

Belridge Oil Co. 49-36 fee 35-27s-20e
Flowed 175 bbl., 50.8 gravity, 7 per cent cut, 10,930,-000 cu. ft. gas; two 96/64-in. beans; pressures 475/1,675 lb.; elev. 632 ft.; T.D. 8,080 ft.; 8⅝-in. water string 7,718 ft.; 378 ft. 4¾-in. liner 8,080 ft.; 250-mesh perf. 7,741-8,080 ft.; 8,049 ft. 2½-in. tubing. Schlumberger: U point 7,565 ft., V point 7,690 ft. Deepened from Temblor oil sand at 5,595 ft. to Wagon Wheel zone of Eocene age. Bottomed in oil sand. Kern County.

Canal Field

Ohio 21-E Kern County Land 13-30s-25e
Flowed 310 bbl., 36.4 gravity, 1.4 per cent cut, 350,-000 cu. ft. gas; 42/64-in. bean; pressures 100/400 lb.; elev. 331 ft.; T.D. 8,248 ft.; 7-in. water string 8,232 ft.; 36 ft. 4¾-in. liner 8,248 ft.; perf. 8,232-48 ft.; 8,220 ft. 2-in. tubing including 250 ft. 2½-in. and packer 8,061 ft. Schlumberger: N point 7,949 ft. Stevens oil sand 8,232-48 ft; 61 days drilling time. Kern County.

Coles Levee Field

Ohio 12-F Kern County Land 2-31s-25e
Flowed 570 bbl., 32.3-gravity, 5.3 per cent cut, 700,-000 cu. ft. gas; 48/64-in. bean; pressures 125/650 lb.; elev. 310 ft.; T.D. 9,885 ft.; 7-in. water string 9,458 ft.; 499 ft. 4¾-in. liner 9,883 ft.; 100-mesh perf. 9,531-9,883 ft.; 9,872 ft. 2½-in. tubing. Schlumberger: N point 9,289 ft., top F01 oil sand 9,458 ft.; bottomed in Stevens oil sand; 96 days' drilling time. Kern County.

Tupman Field

Richfield 18-27-B Kern County Land 27-30s-25e
Flowed 1,248 bbl., 34.1 gravity, 5 per cent cut, 700,-000 cu. ft. gas; 34/64-in. bean; pressures 500/750 lb.; elev. 317 ft.; T.D. 5,509 ft.; P.B. 9,425 ft.; 7-in. water string 8,790 ft.; 674 ft. 5½-in. liner 9,420 ft. perf. 8,781-8,890 ft., 9,046-9,222 ft., 9,275-9,420 ft.; 9,103 ft. 2½-in. tubing with packer 8,916 ft.; N point 8,560 ft.; top first Stevens oil sand 8,798 ft.; bottomed in gray sand at 9,509 ft. but in oil sand at plugged depth; 117 days' drilling time. Kern County.

Greeley Field

Standard 12-11 Kern County Land 7-29s-26e
Flowed 3,370 bbl., 34.4 gravity, 3 per cent cut, 2,863,-000 cu. ft. gas; 32/64-in. bean; pressures 1,225/1,520 lb.; elev. 339 ft.; T.D. 11,510 ft.; 7-in. water string 11,285 ft.; 271 ft. 5-in. liner 11,282 ft.; perf. 11,281-11,487 ft. 2⅞-in. tubing. Completed in Rio Bravo and Vedder oil zones; top Rio Bravo 11,298 ft.; bottomed in oil sand; 129 days' drilling time. Kern County.

Kettleman North Dome Field

Standard 344-13-H fee 13-21s-13e
Flowed gas lift 56 bbl., 32.5 gravity, 30 per cent. 500,000 cu. ft. gas; 64/64-in. bean; pressures 100/575 lb.; elev. 730 ft.; T.D. 10,873 ft. 6⅝-in. water string 10,674 ft.; 221 ft. 4¾-in. liner 10,869 ft.; perf. 10,790-10,869 ft.; 10,594 ft. 2½-in. tubing; top Brown shale 6,620 ft.; top McAdams sand 10,789 ft.; bottomed in Eocene oil sand; 148 days' drilling time. Fresno County.

Midway-Sunset Field

Alford Oil Co. 9 Fried 25-12n-24e
Pumped 400 bbl., 23.5 gravity, 5 per cent cut; elev. 671 ft.; T.D. 2,874 ft.; 8⅝-in. water string 2,658 ft.; 245 ft. 6⅝-in. liner 2,873 ft.; 100-mesh perf. 2,773-2,873 ft.; 2,834 ft. 2½-in. tubing; top productive Hallmark oil sand 2,656 ft.; bottomed in oil sand; 37 days' drilling time. Kern County.

Ten Section Field

Shell 45-29-A Kern County Land 29-30s-26e
Flowed 1,115 bbl., 33.9 gravity, 1.1 per cent cut, 1,172,000 cu. ft. gas; 64/64-in. bean; pressures 500/1,650 lb.; elev. 332 ft.; T.D. 8,239 ft.; 4½-in. combination string 8,231 ft.; perf. 7,965-8,050 ft., 8,100-8,175 ft., 8,185-8,223 ft.; 7,941 ft. 2-in. tubing; drilled by slim-hole method, using tubing as drill pipe and then as combination string. Completed in productive Stevens oil sand, 26 days' drilling time. Kern County.

Shell 85-29-A Kern County Land 29-30s-26e
Flowed 2,219 bbl., 33.6 gravity, 0.4 per cent cut, 2,041,000 cu. ft. gas; 64/64-in. bean; pressures with 16/64-in. bean 1,140/1,220 lb.; elev. 336 ft.; T.D. 8,220 ft.; 4½-in. combination string 8,261 ft.; perf. 8,084-8,216 ft.; 8,067 ft. 2-in. tubing. Completed by slim-hole method in productive Stevens oil zone, 26 days' drilling time. Kern County.

Shell 65-30-A Kern County Land 30-30s-26e
Flowed 1,643 bbl., 34.3 gravity, 1.9 per cent cut, 1,422,000 cu. ft. gas; open line; pressures 100/1,150 lb.; elev. 327 ft.; T.D. 8,210 ft.; 4½-in. combination string 8,204 ft.; perf. 7,984-8,153 ft., 8,162-8,204 ft.; 7,966 ft. 2-in. tubing. Completed by slim-hole drilling

Resolved: In 1941 — I'll Use Utility Electric Power and Increase My Profits!

Speaking of practical resolutions, you can't beat this one if you really want to increase power efficiency and profits.

Utility Electric Power affords you many EXTRA advantages not available with any other type of power. For example:

It is accessible where and when you need it, in the exact amount desired to do the job. As to costs, there is no capital power investment when you use Utility Electric Power. You pay for the power only as you use it.

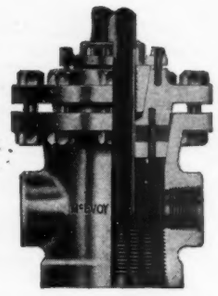
When you consider that installation, operation and maintenance costs of electrically powered equipment is low, and its salvage value is greater, isn't it reasonable to believe that the net result will be *greater profits* for you? So why not resolve to use Utility Electric Power in 1941!

Use Utility Electric Power

PETROLEUM ELECTRIC POWER ASSOCIATION

LOW COST Tubing Head

with slips above packing



Drawing shows thick packing, slips above packing and hold down ring for slips. This head is very popular for pumping wells.

Here is a low cost moderate pressure tubing head with slip suspension of tubing above packing.

You can adjust your tubing under pressure because the slips are above packing.

Hold-down ring for slips insures positive grip. Tubing cannot drop.

Thick, oil resistant rubber packing acts as a shock absorber to relieve stress in tubing of pumping wells.

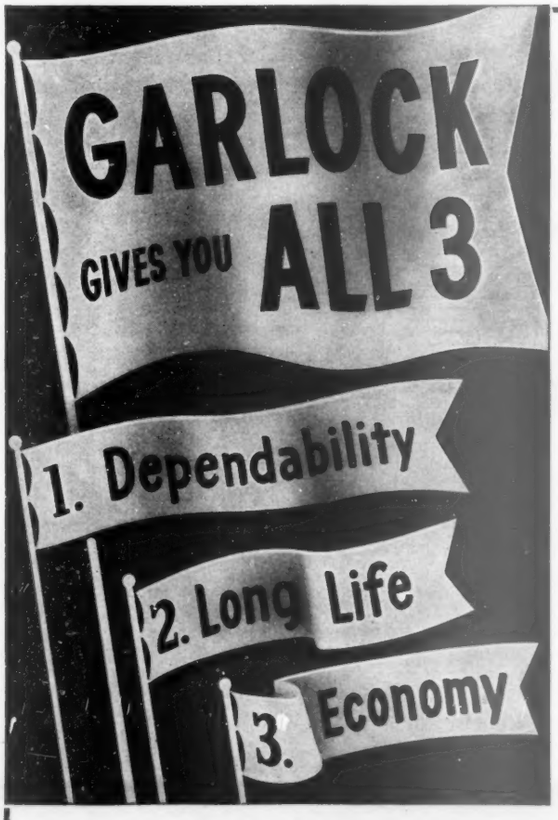
Save on first cost and reworking time by installing the McEvoy Type LS Tubing Head on your next well. Order it through your favorite supply store.

SEE McEvoy Section of 20 PAGES in the Composite Catalog

McEVOY COMPANY

TEXAS AT MILBY, HOUSTON, TEXAS

EXPORT OFFICE: 30 CHURCH ST., NEW YORK



These three qualities are essential for superior packing performance: 1. *Dependability* even under the most severe service conditions; 2. *Long Life* that prevents frequent shutdowns for repacking; 3. *Economy* that keeps down maintenance costs. Garlock gives you *all three*. For outstanding service, standardize on GARLOCK!

The Standard Packing of the World

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

TULSA, OKLA. HOUSTON, TEXAS LOS ANGELES, CALIF.

method in productive Stevens oil zone; 23 days' drilling time. Kern County.

SAN JOAQUIN VALLEY OUTPOSTS

Coles Levee Field

Standard 20-8 Kern County Land 5-31s-25e
Drilling 8,998 ft. in hard sandy shale. Kern County.
Union 58-2 Kern County Land 2-31s-25e
Drilling 8,998 ft. in sandy shale. Kern County.

Elk Hills Field

Standard 42-31-S 31-30s-24e
Drilling 5,994 ft. in sand and shale. Kern County.

Kettleman North Dome Field

Standard 1-1-U fee 1-23s-16e
Drilling in hard gray shale 10,690 ft. Kern County.

Midway-Sunset Field

No. Amer. Oil Consd. 1-28 W.P. 28-32s-23e
Drilling ahead. Kern County.

Paloma Field

Western Gulf 12-12-B Kern County Land . . 12-32s-26e
Milling on iron at 9,746 ft. Kern County.

Rio Bravo Field

Union 41-33 Pacific States 33-28s-25e
Drilling 9,992 ft. in sandy shale. Kern County.

Strand Field

Associated 25-7-E Kern County Land 7-30s-26e
Drilling 11,100 ft. hard sand and shale. Kern County.

Wheeler Ridge Field

Richfield 2 Kern County Land 28-11n-20w
T.D. 11,060 ft.; retesting shutoff. Kern County.

SAN JOAQUIN VALLEY WILDCATS

Panoche District

Jergins Trust 2 Cheney 29-14s-13e
Drilling 7,360 ft. in Moreno shale. Several formation tests at various depths showed small amount of gas but no free oil. Fresno County.

Buena Vista Hills District

Honolulu 25-P fee 10-32s-24e
T.D. 11,300 ft., milling on iron. Kern County.

Potrero Hills District

Richfield 3 Potrero 10-4n-1w
Drilling 3,285 ft. Solano County.

Rio Bravo District

Wilshire 1 Campen 1-29s-25e
Drilling 11,005 ft. in sandy shale. Kern County.

Sacramento District

Ind. Expl. Co. 1 Unit Plan 19-7n-6e
T.D. 4,812 ft. in basement; top basement 4,806 ft.; P.B. 450 ft.; abandoning. Made formation tests of gas shows at 2,400-2,600 ft. and 4,780-4,806 ft.; gas shows at 2,720 ft. not tested. Sacramento County.

Tejon District

Richfield 1 Tejon ranch 2-10s-19e
Drilling in gray sand and shale. Kern County.

Union Avenue District

Hancock Oil Co. 1 Roberts 6-30s-28e
Drilling 5,610 ft. in Chanac oil sand and shale.

Tracy District

Standard 1 Blewett 25-3s-6e
T.D. 3,872 ft.; preparing to make production test. Formation test 3,853-72 ft. showed blow at daily rate of 8,000,000 cu. ft. Indications point to probable discovery of new dry gas field by Standard at this point. Located about 10 mi. SE of Tracy; elev. 62 ft. San Joaquin County.

COASTAL DISTRICT

In Ventura County the Palma Oil Co. is building road to the location for an exploratory well to be drilled on a lease block embracing 510 acres in 5-3-19. The company expects production between 1,400 and 1,700 ft., from the Sespe formation. In Santa Barbara County Milburn & Hamilton have abandoned their No. 1 core-hole well on the Rutherford property in Santa Barbara County. Drilling permits have been issued during the week to Western Gulf Oil Co. for 1 Lechler in the Del Valle field and Tide Water Associated Oil Co. for 26 Hartmann in the Ventura Avenue field.

Russell Havenstrite expects to start another well shortly in the Del Valle field, his second well having been brought in on the last day of December. This was 2 Lincoln and it is about 600 ft. south of the discovery well and producing from an entirely different sand. It flowed 2,500 bbl. daily of 36.5-gravity oil from 6,221 ft. with about 2,500,000 cu. ft. of natural gas. The discovery well, which was bottomed at 6,600 ft., had a heavier gas pressure than No. 2 and it is claimed by some field men that the productive zone in No. 2 was either missed completely by the discovery well or at the time was not sufficiently interesting to justify a production test. Mr. Havenstrite has made a deal for the casinghead-gasoline plant which was erected by the Rancho Gasoline Corp. in the Reserve area on Tejon ranch. The plant has been moved to the Del Valle field, where it will shortly begin operations. Its present capacity is about 5,500 gal. of casinghead gasoline per day. Havenstrite's discovery well is reported to have about 10,000,000 to 15,000,000 cu. ft. of gas daily in the Del Valle field.

Santa Maria Valley

There may have to be some corrective work done

(Continued on Page 79)

West Cote Blanche Field Is Proved to Be on Salt Dome

By F. L. SINGLETON

NEW ORLEANS, La., Jan. 6.—The West Cote Blanche field, St. Mary Parish, was added to the list of known producing salt domes in coastal Louisiana with the discovery of salt material in Texas 6 West Cote Blanche. Salt formation was topped at 7,820 ft., and was drilled to a total depth of 7,854 ft. The hole was plugged back to 7,679 ft. and the well was completed through perforated casing at 7,640-58 ft. for an initial production of 277 bbl. of 32.1-gravity oil per day flowing through a 10/64-in. choke. Working pressure was 1,070 lb. The well is located in 20-15s-6e, about ¼ mile west of production, and the completion opens the fourth producing horizon for the field. The discovery well, Texas 1 State West Cote Blanche was completed as a small producer at 3,109-36 ft., while additional development opened production at 5,000 and 9,000 ft.

SUMMARY OF COMPLETIONS

Louisiana Gulf Coast

	No.	Bbl.	Footage
Oil wells	5	1,452	33,334
Dry holes	1	.....	1,747
Total	6	.....	35,081

Lisbon-Iberia Oil Corp. 1 Calcasieu National Bank, a wildcat located in the Lakeside area, northwest of the Grand Lake field, Cameron Parish, is being watched with considerable interest as it drills ahead in shale below 9,860 ft. after logging favorable showings. An electrical survey showed the following zones which carried slight oil and gas odors in sidewall cores: 6,192-6,200 ft., 8,733-8,748 ft., 9,222-28 ft., 9,518-36 ft., and 9,545-57 ft. Location is in 19-12s-4w, and the well is scheduled to be drilled to a contract depth of 10,200 ft. before any attempt is made to test.

Reports that H. C. Cockburn et al 1 Gianeloni, a wildcat south of the University field, East Baton Rouge Parish, had logged oil and gas showings could not be confirmed, and the well is shut down at 8,956 ft. after an electrical survey failed to reveal any showings of oil or gas.

On the Bayou Des Glaize dome, Iberville Parish, Humble 3-B Wilberts is coring in hard sand at 9,506 ft. One foot of sandy shale with a distillate odor was recovered in a core at 9,430-38 ft. while 1 ft. of shaly sand with a distillate odor was recovered at 9,438-45 ft. This well is located approximately 200 ft. from the company's 2-B Wilberts which was completed at 8,648-57 ft. for an initial production of 345 bbl. per day through a ¼-in. choke. However, production was short lived, and the well was later abandoned.

In Terrebonne Parish and located in the Point Au Fer area, Barnsdall 2 Nelson reached a depth of 11,400 ft., and the hole has been plugged back, sidetracked, and the company will redrill a new hole to test at 6,979-96 ft. where sand with a favorable showing was cored. The parish gained a new wildcat operation as Stanolind Oil & Gas Co. began dredging canal to 1 Continental Land & Fur Co., located 1,980 ft. north of the south line and 660 ft. west of the east line of 34-18s-4e. The well is situated in what is known as the Lake Penchant area.

On the Avery Island salt dome, Iberia Parish, Gulf Refining Co. is preparing to spud 1 Petit Anse Co., a projected deep test in 59-13s-6e, about 200 ft., 69° west from Texas 1 Petit Anse Co., the only deep test ever drilled on this old salt dome structure. Frank Campbell 1 Gabrael Darby, 56-11s-6e, which was abandoned December 9 at 8,012 ft., has been deepened to 8,860 ft., and is now shut down.

Westwego Discovery

Location for a new test was announced for the Westwego area, Jefferson Parish, by Reese E. Carter for 1 Marrero. The well is in 3-13s-23e, about ¼ mile east of Titanic Oil Co. 1 Marrero Land & Improvement Co. which is drilling in sidetracked hole below 8,849 ft. The latter well is expected officially to open the district's next field as it blew out several weeks ago at approximately 9,900 ft., and had to plug back and sidetrack due to mechanical trouble as the result of excessive gas pressure.

W. T. Burton and Continental Oil Co. joint wildcat, 1 Mayo Realty in the South Lake Charles prospect, Calcasieu Parish, has been abandoned and additional development is expected to get underway in the near future. This test reached a depth of 10,939 ft. and blew out twice, resulting in considerable mechanical trouble which made testing impracticable.

On the west side of the Iowa field, Jefferson Davis Parish, Magnolia Petroleum Co. is attempting to complete 16 Wait in the 6,900-ft. sand. This well was recently completed at 8,200 ft. in Frio sand, but due to salt-water encroachment it went dead. The well apparently defines the west limits of the deep pay. Barnsdall 4 Fontenot is bottomed at 8,508 ft. with the drill stem stuck, while Stanolind 1 Willet is drilling in shale at 6,327 ft. A new operation was being started as Shell prepared to deepen 6 Fontenot, an old 6,900-ft. producer.

Grand Bay

In the Grand Bay field, Plaquemines Parish, Gulf 7-A Grand Prairie Levee District was drilled to a total depth of 11,014 ft. and 7-in. casing was cemented on

(Continued on Page 87)

NATIONAL BANK OF TULSA

The Oil Bank of America

Statement of Condition December 31, 1940

RESOURCES

Cash and Due from Banks	$ 34,491,341.99	
U. S. Government Securities	13,941,230.27	
Other Bonds and Warrants	3,890,764.82	$ 52,323,337.08
Loans and Discounts		15,897,963.05
Overdrafts		5,270.73
Income Receivable Accrued		114,798.79
Stock in Federal Reserve Bank		180,000.00
Bank Premises		2,917,500.00
Customers' Liability under Acceptances		9,126.00
TOTAL		$ 71,447,995.65

LIABILITIES

Deposits		$ 64,197,566.92
Acceptances Executed		9,126.00
Income Collected Not Earned		56,310.37
Reserve for Taxes, Interest, Etc.		62,997.81
Reserve for Preferred Dividends		9,000.00
Capital—Preferred	$ 600,000.00	
Capital—Common	2,700,000.00	
Surplus	2,700,000.00	
Undivided Profits	1,112,994.55	7,112,994.55
TOTAL		$ 71,447,995.65

DIRECTORS

H. G. BARNARD
Investments

A. E. BRADSHAW
President, *National Bank of Tulsa*

W. A. BROWNLEE
Executive Vice-President, *National Bank of Tulsa*

EDWARD H. CHANDLER
General Counsel, *Sinclair Prairie Companies*

J. A. CHAPMAN
Investments

T. A. CREEKMORE
President, *Summit Drilling Company*

J. C. DENTON
Vice-President, *Mid-Continent Petroleum Corporation*

JOHN H. DUNKIN
Secretary and Treasurer, *Brown-Dunkin Company*

E. I. HANLON
President, *Henaghan and Hanlon, Inc.*

JOS. L. HULL
Counsel, *National Bank of Tulsa*

J. J. LARKIN
President, *Larkin Torpedo Company*

A. H. ROGERS
Secretary, *J. A. Chapman and H. G. Barnard*

CHARLES A. STEELE
Attorney-at-Law

C. H. SWEET
Vice-President, *National Bank of Tulsa*

Member Federal Deposit Insurance Corporation

By

STAFF CORRESPONDENT

West Liberty Pool Extended Both North and South

MATTOON, Ill., Jan. 6.—Despite a slump in Illinois activity during the recent holidays, initial production for the state was far above average. A total of 78 oil wells, 14 dry holes and 1 gas well was completed during the past 2 weeks. Of these, 44 oil wells, 2 dry holes and 1 gas well were completed during the past week. Total initial production for the 78 producers was 18,077 bbl., or 232 bbl. per well. White County remained the most active area throughout the holiday season with the completion of 37 oil wells and 3 dry holes. Of these, 19 producers were in the East Calvin pool and 10 were in the North New Harmony pool. The second most active area was Hamilton County with nine completions while Fayette County was third with six completions. The majority of the completions in the latter two counties was in the Hoodville and Louden pools.

West Liberty Development

The West Liberty pool in the extreme southern part of Jasper County promises to become one of the major pools of the state. Recent developments have extended the pool approximately 1½ miles northward and 1 mile southward. The extension wells total seven in number, and all but one of these have had initial productions in excess of 1,200 bbl. Three of these wells have been completed in the area approximately half way between the West Liberty and Dundas pools and will probably link the two pools. If this proves to be true, the entire pool will cover more than 16 sq. miles and will be comparable in extent to the Salem pool of Marion County. Production in the Dundas, West Liberty and the extension wells is from the McClosky.

SUMMARY OF COMPLETIONS

(Two weeks ended January 4, 1941)

	No.	Bbl.	Footage
Oil wells: Albion	3	949	6,443
Boyleston	3	387	9,845
Dundas	3	207	8,745
East Calvin	19	2,860	52,296
Hoodville	8	1,853	23,691
Louden	6	1,502	9,179
Mill Shoals	4	652	13,172
North New Harmony	10	3,309	29,681
West Liberty	4	4,420	11,226
Other pools	15	1,642	40,134
Wildcats	3	296	8,587
Dry holes: Fields*	9	.....	23,903
Wildcats	5	.....	8,519
Total	92	.....	246,511
Gas wells	1	.....	1,090

*Albion 1, Boyleston 1, Cravat 1, Maud 1, Mill Shoals 1, North Griffin 1, Patoka 1, Swick 1, West Irons 1.

Deep Tests

Information which may decide the future of three of Illinois' major oil fields was being held in strict secrecy during the past week. This information regards the outcome of the three most important ventures in the Illinois oil industry during the past year.

In Fayette County where development of the Chester sand formations in the Louden field is practically completed, Carter 1 Hogan heirs has been drilled as a stratigraphic test to determine the productiveness of deeper formations. This test was started November 15, and was plugged a few days ago. It had not been intended to complete the well as a producer regardless of its findings. What this test encountered in the deep formations remains a secret of the company but may be revealed by future development of the company's holdings in the area. The equipment used in drilling this well was capable of exploring to depths that would have taken the test through the Devonian and Trenton limes and the St. Peter sandstone.

Developments at Paul Rossi 8 Brooks, SW NE SW 29-2n-8e, first Trenton test in the Salem field of Marion County, indicate that saturation has been found in the Trenton lime, although its productive possibilities are still an unknown quantity. The well is bottomed at 4,510 ft. at the present time and casing has been set. Success of this well would insure a revival of activity in the Salem field where development of the more shallow formations is practically completed.

The third important test, B. E. Martin 1 Robinson, SW SE SW 4-2n-1e in the Sandoval field, found a show of oil in the Trenton lime but failed to produce after casing was cemented. This well, originally a Trenton test, is being drilled deeper to test the St. Peter sandstone. Present total depth is 4,965 ft.

Two Pools Opened

Two new fields were opened during the week in Hamilton and White counties to launch Illinois' oil activity for 1941. Other primary exploration for the new year was featured by the near completion of an important wildcat in Franklin County.

Dick Duncan 1 Zeller, SE NE NE 34-3s-5e, a Gulf Refining Co. farmout, flowed approximately 350 bbl. initially from the McClosky lime at 3,337-59 ft. to give Hamilton County a new pool near Dahlgren. Gulf, Exchange and several independents hold acreage in the area which is about 6 miles from the nearest other production. Exchange has announced an east offset to the discovery well.

The discovery well of the new White County pool, Cochrane 1 Hattie Golden, SW SE NE 29-5s-14w, swabbed 200 bbl. per day while testing the Waltersburg at 2,255-85 ft. This well is approximately 2 miles southwest of the nearest production on Ribeyre Island in the Wabash River.

E. S. Adkins 1 Orient Coal, NE SW SE 24-6s-2e, a prospective pool opener near Benton, Franklin County, was near completion last week end. This well is testing Tar Springs saturation at 2,111-23 ft.

ILLINOIS COMPLETIONS

Adams County

Wildcat: Henry Schuster 1 fee ...NW SE SW 25-2n-6w Dry, T.D. 280 ft.

Edwards County

Albion pool: Superior 3 M. Works SW SW NW 18-2s-11e Flowed 854 bbl., 4 per cent water, McClosky 3,111-16 ft., 3,169-73 ft., O.W.D.D. 3,111-73 ft.

Morrison 2 W. Barnes ..... SW SW SE 13-2s-10e Pumped 60 bbl., McClosky 3,120-27 ft., 3,199-3,207 ft., 5,000 gal. acid, T.D. 3,213 ft.

Continental 3 Stafford ..... SW SE NE 13-2s-10e Pumped 3 bbl. oil and 543 bbl. water, 3,000 gal. acid, McClosky 3,128-37 ft., 3,181-89 ft., 3,199-3,208 ft., P.B. 3,150 ft., 4,000 gal. acid, squeezed, perf. 3,132-45 ft., 2,000 gal. acid, pumped 35 bbl., T.D. 3,230 ft.

Continental I. J. Cowling ... NE NE NE 13-2s-10e Dry, Menard 2,335 ft., Glen Dean 2,580 ft., Cypress 2,827 ft., Benoist 3,003 ft., Ste. Genevieve 3,135 ft., T.D. 3,260 ft., P.B. 3,248 ft., 2,000 gal. acid McClosky 3,234-38 ft., water, set packer, 2,000 gal. acid McClosky 3,171-74 ft., pumper 2 bbl. oil and 475 bbl. water.

Fayette County

Louden pool: Magnolia 8 Sarah Clow SW SE SW 32-8n-3e Flowed 486 bbl., 2-in. tubing, 40-qt. shot 1,507-23 ft., 10-qt. shot 1,430-40 ft., Cypress sand 1,420-29 ft., 1,434-45 ft., 1,456-62 ft., Paint Creek 1,497-1,502 ft., T.D. 1,523 ft.

Luttrell et al 1 Bail ..... NE SW SE 16-7n-3e Pumped 27 bbl. oil and 5 bbl water, 10-qt. shot 1,567-72 ft., Cypress sand 1,566-70 ft., saturation, T.D. 1,577 ft.

Magnolia 33 T. C. Clow ..... NE SE NW 5-7n-3e Flowed 196 bbl., 2-in. tubing, 20-qt. shot 1,486-91 ft., 10-qt. shot 1,405-12 ft., Weller 1,397-1,449 ft., Paint Creek 1,449 ft., Paint Creek stray 1,470-76 ft., T.D. 1,492 ft.

Magnolia 32 T. C. Clow ..... NW NW NE 5-7n-3e Pumped and flowed 524 bbl., 40-qt. shot 1,520-36 ft., 20-qt. shot, 1,455-72 ft., Cypress sand 1,443 ft., Paint Creek 1,487 ft., Paint Creek stray 1,500-08 ft., T.D. 1,536 ft.

Magnolia 28 T. C. Clow ..... SE SW NE 5-7n-3e Pumped 222 bbl., T.D. 1,554 ft.

Mudge Oil 4 Devore ..... SE NE SE 1-7n-2e Pumped 47 bbl., 40-qt. shot 1,471-97 ft., Cypress sand 1,460 ft., T.D. 1,497 ft.

Franklin County

Thompsonville pool: Hook & Ring 1 Marvel ..... SE NE NE 34-7s-4e Pumped 15 bbl. oil and 15 bbl. water, 4,000 gal. acid, 10-qt. shot, 2,000 gal. acid, McClosky 3,107-21 ft.

Hamilton County

Hoodville pool: Shell 6 N. Porter NW SW SE 34-5s-6e Pumped 192 bbl. oil and 3 bbl. water, 10-qt. shot, Benoist 2,931-59 ft., T.D. 2,963 ft.

Shell 7 N. Porter ..... NE SE SE 34-5s-6e Pumped 101 bbl., 10-qt. shot, Benoist 2,928-52 ft.

Shell 5 N. Porter ..... SE SW SE 34-5s-6e Pumped 260 bbl., 10-qt. shot, Benoist 2,952-62 ft., T.D. 2,962 ft.

Carter 2 T. M. Friel ..... NE SW SE 27-5s-6e Pumped 203 bbl. oil and 20 bbl. water, 20-qt. shot, Benoist 2,939-54 ft., T.D. 2,964 ft.

Ohio 2 Grimes ..... SW NW NW 2-6s-6e Pumped 133 bbl., 20-qt. shot, Benoist 2,940-59 ft.

Ohio 1 H. Matheny ..... NW NW SE 3-6s-6e Pumped 556 bbl., 20-qt. shot, Benoist 2,953-85 ft.

Texas 5 G. G. Edwards ..... SE NE NE 3-6s-6e Pumped 138 bbl., 8-qt. shot, Benoist 2,922-46 ft.

Texas 2 Hood ..... NW NW NE 3-6s-6e Pumped 270 bbl., 15-qt. shot, Benoist 2,932-60 ft.

Dale pool: Cameron 1 Brill ..... SW SE NE 6-6s-7e Pumped 40 bbl. oil and 25 bbl. water, 30-qt. shot, Cypress 2,712-32 ft.

Jasper County

Swick pool: Nu-Oil, Inc., 1 Acklin heirs ..... NW SE NW 17-6n-10e Dry, 3,000 and 5,000 gal. acid, Glen Dean 2,327 ft., Golconda 2,406 ft., Barlow 2,459-82 ft., Cypress 2,558-2,623 ft. (water), Paint Creek 2,670-75 ft., Benoist 2,682-2,711 ft., show oil 2,682-95 ft., Renault 2,720-24 ft., Aux Vases 2,739-49 ft. (show oil) and 2,766-82 ft., Ste. Genevieve 2,808 ft., Rosiclare 2,827-33 ft. (show oil), Fredonia 2,865 ft.

Lain O. & G. 3 C. E. Henry ...NW SW NW 17-6n-10e Abandoned location.

Lain O. & G. 2 C. E. Henry ... NW NW SW 17-6n-10e Pumped 170 bbl. oil and 80 bbl. water, natural, Aux Vases 2,762 ft., pay 2,862-81 ft., T.D. 2,892 ft.

West Liberty pool: Pure 1 W. Kermicle B ..... W½ SE SE 32-6n-10e Flowed 1,601 bbl., 2-in. tubing, 1-in. choke, 5,000 gal. acid, pay 2,772-80 ft., T.D. 2,800 ft.

Pure 1 E. Musgrove ..... W½ NW SE 20-5n-10e Flowed 1,004 bbl., 1-in. choke, 5,000 gal. acid, pay 2,795-2,800 ft., 2,809-13 ft., T.D. 2,820 ft.

Pure 1 I. W. Dickerson A ..... E½ SW NW 17-5n-10e Flowed 1,276 bbl., 2-in. tubing, 1-in. choke, 5,000 gal. acid, pay 2,799-2,810 ft., T.D. 2,821 ft.

Pure 1 J. S. Mattingly ..... E½ NW NE 5-5n-10e Flowed 539 bbl., 1-in. choke, 5,000 gal. acid, pay 2,750-55 ft., T.D. 2,785 ft.

Jefferson County

Dix pool: N. Redwine 1 Cameron NW NW NE 16-1s-2e Pumped 100 bbl., 10-qt. shot, Benoist 1,936-46 ft.

Cravat pool: M. Siegel 1 Roper ..... NE NE SE 9-1s-1e Dry, Glen Dean 1,696 ft., Benoist 2,043-44 ft.

Lawrence County

Russellville pool: Kentucky Nat. & Parriott 4 Bierhaus S½ NW SE 13-4n-11w Est. 30,000 cu. ft. Bridgeport 779 ft., 29,000 cu. ft. Buchanan 1,069-90 ft., producing from Buchanan.

Macon County

Wildcat: J. H. Williams 1 Kater..SW SE NW 17-15n-2e Dry, Golconda 1,055 ft., Cypress 1,114-82 ft., Paint Creek 1,208-13 ft., Benoist sand 1,235-50 ft., Aux Vases 1,308-18 ft., 1,325-39 ft., Ste. Genevieve 1,339 ft., Devonian 2,310 ft., T.D. 2,333 ft.

Marion County

Patoka pool: Adams 3 J. Ingles ....NE SW NE 28-4n-1e Dry, Glen Dean 1,138 ft., Cypress 1,277 ft., Paint Creek 1,370 ft., Benoist 1,444 ft., T.D. 1,458 ft.

Fairman pool: Shell 7 A. Ververs. SE NE NW 18-3n-1e Pumped 250 bbl., Benoist 1,426-36 ft.

Sandoval pool: Southwestern 13 Stein ..... SE SW SE 5-2n-1e Pumped 75 bbl. oil and 75 bbl. water, 100 gal. acid, Devonian 2,893 ft., pay 2,945-46 ft.

Richland County

Dundas pool: Pure 3 E. J. Billings W½ NE SE 31-5n-10e Flowed 114 bbl., Cypress 2,528-52 ft., McClosky 2,829-32 ft. and 2,847-53 ft., T.D. 2,860 ft.

Pure 8 J. H. Wachtel ..... E½ SW SW 6-4n-10e Pumped 86 bbl., McClosky 2,872-84 ft., 5,000 gal. acid, T.D. 2,940 ft.

Dyson & Anderson 2 Ash ..... SW SW NW 18-4n-10e Pumped 7 bbl. oil and 5 bbl. water, 5,000 gal. acid, McClosky 2,928-37 ft., T.D. 2,945 ft.

North Noble pool: Pure 3 M. B. Sparr SE SW SW 24-4n-9e Pumped 54 bbl., 30-qt. shot, Paint Creek stray 2,582-2,600 ft.

Washington County

Irvington pool: Magnolia 6 O. Rahn ..... E½ SW NW 23-1s-1w Flowed 254 bbl., 8 per cent water, 3,000 gal. acid, Devonian 3,101 ft., pay 3,143-48 ft.

Wildcat: McBride 1 H. Frieman .SE NW NW 29-3s-4w Dry, Menard 557 ft., Glen Dean 675 ft., Golconda 747 ft., Cypress 888 ft., Paint Creek 957 ft., Benoist 975 ft., Renault 1,055 ft., Aux Vases 1,072 ft., Fredonia 1,138 ft., T.D. 1,155 ft.

Chambers et al 1 Kraemer ... NW NE SE 17-3s-4w Dry, Glen Dean 775 ft., Golconda 850 ft., Cypress 1,000 ft., Benoist 1,110 ft., T.D. 1,149 ft.

Wayne County

Clay City pool: Pure 1. E. R. Hossleton B ..... E½ NE SW 21-2n-8e Pumped 36 bbl., Cypress 2,625-55 ft.

Enterprise pool: Pure 3 E. J. Feller NE SW NW 5-1n-8e

(Continued on Page 86)

By T. R. INGRAM

Holidays, Winter Weather Reduce Activity

DENVER, Colo., Jan. 6. — Completions during the holidays in the Rocky Mountain area were limited to seven wells in Wyoming and two in Montana. None of them were outstanding. The Vermillion Oil Co. 1 Horrocks, an extension of the Hiawatha gas field on the Wyoming side, reported last week to have encountered a deeper sand, was recompleted for 12,000,000 cu. ft. of gas. Two completions in Lance Creek were Continental 22 Tom Bell for 144 bbl. in the Leo sand and same company's 23 Tom Bell for 71 bbl. on a swabbing test. The Osage field had a completion above the average in Carl Kundy No. 5 for 70 bbl. Riggs Oil 4 State, a test to the Sundance, was dry and abandoned. R. D. Miller 1 Commercial, in Crook County, was abandoned, and Thatcher & Jay No. 1 is estimated good for 20 bbl. in shale above the Muddy.

The Montana completions were in Cut Bank, in Glacier Production Co. 5 Simero for 110 bbl. and same company's 8 State for approximately 25 bbl.

New operations include one for the Ohio Oil Co. in Lance Creek, a wildcat near the Canadian boundary in Ed Reagan 1 Tribal-194, and one in Kevin-Sunburst.

SUMMARY OF COMPLETIONS

Wyoming

	No.	Bbl.	Footage
Oil wells: Lance Creek	2	*215	10,674
Other fields	2	89	2,610
Dry holes	2	....	4,534
Gas wells	1	†1.2	3,540
Total	7	.....	21,358
Recompletion	1	†12.0	.....

Montana

Oil wells: Cut Bank	2	*135	5,733

*Barrels. †Million cu. ft.

COLORADO

Boulder County

Bartson Oil 1 Chenburg ..... SW SW SE 15-2n-70w
Spudded.
J. A. Warren 3 Maxwell ..... NW NE NW 24-1n-71w
Drilling 990 ft. in sandy shale.

Fremont County

U-Tex Oil 1 Hassler ..... NE 28-20s-69w
T.D. 2,965 ft., 1,000 ft. oil in hole, running tubing to test.

Huerfano County

I. E. Sideman-White 1-X Martinez C SW NE 33-26s-67w
Drilling 1,467 ft. in new hole.

Garfield County

Joe T. Juhan 1 Clough ..... C NW SE 22-6s-94w
Cemented 13⅜-in. on bottom at 570 ft. and S.D.

La Plata County

Nick Spatter 1-X Bryce ..... SW SW 31-33n-9w
Resumed drilling at 4,390 ft. after building heavier rig to test Pennsylvanian.

Larimer County

E. P. Gallup 1 Hanson ..... C SE NW 36-10n-71w
Drilling below 500 ft.

Las Animas County

Barney Oil 1 Dutto-Marchisio.... NW NW 32-33n-62w
Drilling 362 ft.

Logan County

West Plains 1 Sheldon ..... SE NW SW 3-10n-55w
Drilling 3,312 ft. in shale.

Park County

South Park Oil 1 Lamar ..... NE NE SE 34-11s-75w
Drilling 7,660 ft. in sand.

Rio Blanco County

Texas-California 5 Unit..... NW NE NE 34-3n-94w
Drilling 4,270 ft.

Routt County

Mid-Colorado Pet. 1 Omholt ... NE NE SE 29-4n-87w
T.D. 3,160 ft., 2,600 ft. water in hole, preparing to test oil show at 3,135 ft.

WYOMING

Big Horn County

McDonald & Curtis 1 Orchard..... SE NW 24-51n-93w
Drilling 1,465 ft., deep test Torchlight field.

Carbon County

Sinclair-Wyoming 19 Wertz..... SE SW SW 6-26n-89w
Cellar.
Sinclair-Wyoming 20 Wertz..... NE SW NE 7-26n-89w
Cellar.
Sinclair-Wyoming 4-F Mahoney C SW NW 34-26n-88w
Drilling 1,180 ft., cemented 13⅜-in. at 403 ft.
Robinson & O'Donnell 1 State SW SW NE 16-26n-89w
Drilling 1,500 ft., cemented 13⅜-in. at 290 ft.
Sinclair-Wyoming 2-A Mahoney C SW NE 34-26n-88w
T.D. 4,520 ft., cleaning out at 4,410 ft.
Sinclair-Wyoming 16-A Wertz..SW SW SW 6-26n-89w
Drilling 5,978 ft. in Tensleep.
Ohio 2 Lundy..... SE NE NW 34-20n-78w
T.D. 4,210 ft. in Dakota sand, cementing 7-in. at 4,182 ft., water in Dakota, P.B. to 4,096 ft. to test Muddy.

Crook County

Thatcher & Jay 1, NE NE NW 10-49n-66w, Thornton district, had a show of shale oil at 1,140 ft., above the objective Newcastle (Muddy) sand, and will be completed. Estimated at 20 bbl. a day initial.

M. D. Miller 1 Commercial, SW SE 19-49n-66w, Karra Terrace, near Wakefield, was dry in the Wall Creek sand at 1,274 ft., total depth, and was plugged.

Niobrara County

Continental Oil Co. 22 Tom Bell, SE NW NW 34-36n-65w, Lance Creek, was completed at 5,326 ft., total depth, for 144 bbl. in 24 hours from the Leo at 5,281-5,324 ft., after acidizing with 2,500 gal.

Continental 23 Tom Bell, SE NW SW 34-36n-65w, was completed at 5,350 ft. after plugging back from 5,486 ft., and swabbed and flowed 71 bbl. in 8 hours after being shot with 40 qt. at 5,344-50 ft. It will be put on the pump.

Ohio 18 Putnam ..... NE NW NW 4-35n-65w
Rig, first report.
Western Petroleum 1 Mosier ..... SW SW 31-35n-64w
Building rig.
Ohio 9 Agnes Rohlff ..... SE NE SE 32-36n-65w
Drilling 1,550 ft., cemented 11¾-in. at 312 ft. with 150 sacks.
Minnelusa Oil Corp. 4 Jose.... SW NE SW 6-35n-65w
T.D. 5,306 ft., top Leo 5,302 ft., cemented 7-in. at 5,299 ft., drilling plug.

Park County

Continental 2 Northern Pacific NE NW NW 23-58n-98w
T.D. 3,659 ft., swabbed 448 bbl., 20 per cent water, in 24 hr., then 395 bbl., 10 per cent water, waiting on pump test.
Resolute 2 State..... SW SW 16-57n-101w
T.D. 10,121 ft., set whipstock at 7,393 ft., and after redrilling to 7,408 ft., preparing to reset whipstock.

Sublette County

Klumpe Syndicate 1..... NE SW NE 28-27n-113w
Spudded to 80 ft., set casing and S.D.
Texas 1-C Government..... SW NW NW 24-27n-113w
Location.
Texas 1-J Government ..... NW SW SW 27-27n-114w
Drilling 475 ft., cemented surface pipe at 85 ft.
Marvel Oil 6 Government... CEL SE SE 28-27n-113w
Rigging up.
North La Barge Oil 6 Govt. CNL SE NE 28-27n-113w
T.D. 1,120 ft., prepare to test.

Sweetwater County

Vermillion Oil Co. 1 Amelia Horrocks, SW SW SW 7-12n-99w, Hiawatha field, was recompleted at 3,540 ft. after deepening from 3,504 ft., for 12,000,000 cu. ft. of gas a day, 1,200 lb. rock pressure, from sands at 3,474-96 ft. and 3,505-40 ft., in Wasatch formation. It extends the field a mile to the north.

Sinclair-Wyoming 95-A..... SW NW NW 11-26n-90w
Rig.
Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
Drilling 3,550 ft. in Morrison formation.
Sinclair-Wyoming 97-A ..... NW NW SW 11-26n-90w
Cemented 8⅝-in. at 504 ft.

Uinta County

Meridian Oil 2 Pat. ..... NW NW NE 26-13n-119w
T.D. 1,015 ft., trying to shut off water with 6¼-in. and test show oil at 1,012 ft.

Weston County

Carl Kundy No. 5, NE SW SW 29-46n-63w, Osage field, proved to be a good well in sand at 1,280-1,332 ft., and swabbed 70 bbl. a day initial. The sand, which was broken and streaked, was given a shot. The location is more than a mile to the south of the shallow pool on the east side and is to the east of a spotted district extending northwesterly in the direction of the deep pool. While it is not an extension of the proven area, it is in a district in which comparatively little drilling has taken place.

Riggs Oil Co. 4 State, CNL NE SE 16-46n-64w, a cable-tool test to the Sundance sand was dry and abandoned at 3,260 ft. It had a show of oil in a 1-ft. sand at 3,210 ft. The Wall Creek was at 2,015-25 ft.

Most of the drilling wells in Osage are shut down.

Laman-Crowley Oil Co. 1..... SW SW NW 8-46n-63w
Drilling 610 ft. in sand showing some oil.

MONTANA

Big Horn County

Massey Oil & Gas 1 Government..SE SW SE 11-2s-31e
Drilling 2,008 ft. in Dakota.

Blaine County

Cherry Ridge Synd. 1 Harbolt...NW NW SW 1-35n-20e
Landed 10-in. at 1,220 ft., for formation shutoff.

Carbon County

Miracle Oil Co. 2 Government...CWL NE SE 3-6s-23e
T.D. 2,338 ft., reaming to set casing on bottom.

Glacier County

The best of two completions in Cut Bank was Glacier Production Co. 5 Simero, C NW SE 6-33n-5w, which swabbed 110 bbl. first 24 hours at 2,828 ft., total depth, from the Cut Bank sand at 2,781-2,826 ft. The main pay was at 2,820-26 ft. The 7-in. is at 2,785 ft.

Glacier Production Co. 8 State, SW SW NW 16-33n-5w, had 400 ft. of oil in the hole at 2,905 ft., total depth, and was not given a swabbing test. The Cut Bank was at 2,848-2,905 ft., with a shale break at 2,865-76 ft. It was shot with 40 qt. at 2,895-2,905 ft., and is cleaning out.

Ed Reagan and associates have spotted a wildcat on the Reagan (Twin Rivers) structure northwest of the Cut Bank field on a block of leases obtained the past summer from the Blackfeet Indians. It is close to the Canadian border. Newell & Chandler have the contract and after spudding a slim-hole rotary will be moved on.

Ed Reagan 1 Tribal-194..... CEL SE NE 22-37n-7w
Spudder on ground, first report.
Kately, agent, 1 Hagerty..... SE NE NW 15-34n-6w
Rig.
Texas 1 Lander..... C SE NE 20-35n-6w
Spudded.
Texas 2 Aronson..... C NW SW 21-35n-6w
Spudded.
A. P. Consolidated 5 Keisel..... SE SE NW 11-34n-6w
Spudded.
Frank Henderson 1 Tribal-190 NW NW NW 29-32n-5w
Rig.
Dakota-Montana 2 Tribal ..SW SW SW 15-34n-6w
Cemented 10¾-in. at 575 ft., top Colorado 555 ft.
A. B. Cobb 7 Farmers State Bank NE NE SE 17-33n-5w
Drilling 450 ft.
Glacier Prod. 2 Winkler ..... C NE SE 28-33n-5w
Cemented 10¾-in. at 602 ft., top Colorado 585 ft.
Consolidated Gas 1 Frary-Tribal NW NW SE 19-32n-5w
Drilling 410 ft.

Toole County

There were no completions in Kevin-Sunburst.

Hole Brothers 1 Potter is a new operation southwest of the West Kevin pool where two or three small producers were drilled a few years ago, but which proved to be limited to a small area. The new operation is 6 miles east of the nearest gas well in the Cut Bank gas field.

Tolis Drilling Co. 2 Nicholson, NW SE NE 28-35n-3w, a first report last week, has moved off rig.

Hole Brothers 1 Potter ..... C NE NE 23-33n-4w
Drilling 225 ft., 10¾-in. at 160 ft., first report.
Big West Oil 9 Allen ..... CEL SE SW 31-35n-1w
Drilling 580 ft., first report.
High Gravity Oil Prod. 1 Govt. SE NW NE 19-35n-3w
T.D. 1,236 ft., running 8¼-in.
Hannah-Porter 1 Donovan..... C SW SE 8-33n-1w
Drilling 590 ft.
S. T. Scotland 4 McNamoar ... CNL NE SW 29-35n-3w
S.D. 1,779 ft., contact 1,776-79 ft., will acidize.
Twinfields Oil 3 Thompson....NW NW SE 28-35n-3w
T.D. 1,760 ft., show oil and gas followed by water, acidized with 500 gal. after P.B. to 1,745 ft.
Kevin Oil 4 Leach ..... C SE NE 31-35n-3w
T.D. 1,669 ft., cemented 7-in.
A. A. Welch 2 Lerum ..... SE SW NW 25-36n-2w
T.D. 1,658 ft., contact 1,641-58 ft.

NORTHWEST NEW MEXICO

Bernalillo County

David H. Boyd 1 Wright 11-10n-5e
Ready to spud.

(Continued on Page 79)

"PEERLESS" CHROME FACE

The new Chrome Face line on Lufkin Tank Strapping Tapes makes them more outstanding than ever. Jet Black Markings are easy to read against the satin Chrome surface that won't rust, crack, chip, or peel and is easy to clean. The long winding handle permits easy, rapid winding and can be turned over to lock the tape at any point. See them at your dealers.

WRITE FOR FREE CATALOG

LUFKIN

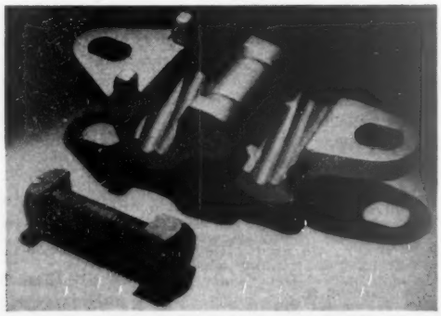
SAGINAW, MICH. New York City

Here's the Answer to Your WIRE LINE CLAMP Problem

Fine Design—Snug Fit—Giant Grip!

The Buck Clamp sets a new high in safety, speed and dependability for wire line clamps. It provides greater gripping surface, increased clamping strength and eliminates kinking of lines because both clamping surfaces are formed to fit the lay of the wire. Replacement parts are limited to the one bolt. Full details on request.

Sold through leading supply stores.
Export Agent—W-K-M Company, Inc.,
74 Trinity Place, New York, N. Y.



Buck Clamp Company

3714 NAVIGATION BLVD.

HOUSTON, TEXAS

Hawkins Play Gathers Speed As Two Wells Blow In

By R. MARNE SANFORD

DALLAS, Tex., Jan. 6.—Early the past week both Rotondi 1 Cobb and Manziel 1 Bell blew in as producers in the Hawkins area of Wood County. Both were nearing the Woodbine sand the previous week and were checking high on structural markers and given a better than average chance of finding production.

With the bringing in of these two wells started the greatest oil boom that eastern Texas has known since the early days of the great East Texas field. Rotondi 1 Cobb, in the townsite of Hawkins, has been officially gaged at 2,910 bbl. of oil daily while Manziel 1 Bell, a mile northwest of the town, continues to blow wild and uncontrolled at the estimated rate of 50,000,000 cu. ft. of gas daily.

Several thousand people, both oil men and sight seers crowded the little town of Hawkins during the past week to witness the boom. By the close of the week the typical lunch stands, map stores, and law offices had been thrown together to handle the increasing tide of oil men and lease buyers. Some six tests have been staked, four of which are already active, and an estimated 30 to 35 drilling permits or tentative locations have been staked in the townsite and the surrounding area.

Rotondi 1 Cobb, George Brewer Survey, in Hawkins, gaged 2,910 bbl. of oil daily, based on a 3-hour flow of 363¾ bbl. of oil. Flow was through 1-in. tubing choke under pressures of 285 lb. on the tubing and 635 lb. on the casing. The discovery in the townsite topped the Woodbine series at 4,398 ft., some 404 ft. higher than Manziel 1 Bell, wild gasser, and some 97 ft. higher than Manziel 1 Morrison, the original discovery well for the area 3½ miles north of the town of Hawkins. The oil in the Rotondi well was 29.5 gravity as against the lower gravity, dark crude found in 1 Morrison.

Meanwhile 1 Bell, a mile northwest of Hawkins, continued to match the efforts of Kinley Brothers, Houston, world famous wild-well fighters, as it blew uncontrolled. It is blowing gas from the sub-Clarksville sand, a member of the Eagleford shale series immediately above the Woodbine series and is still some 139 ft. short of the expected top of the Woodbine, placing it considerably lower, structurally, than the Rotondi discovery yet higher by about 307 ft. than 1 Morrison. The sub-Clarksville was topped at 4,339 ft. and the hole is bottomed at 4,363 ft.

Early in the week and immediately following the Rotondi discovery and the blowout at 1 Bell, several tests were started for the Hawkins area. Just northeast of the townsite discovery Earl Hollandsworth Drilling Co., Longview, is drilling below 2,000 ft. in 1 Robbin, in the northeastern part of the townsite. As a 200-ft. west offset to this operation the same operator is building derrick for a second test on two townsite lots. As an east offset to the Rotondi well Roger Lacey, Longview, is building derrick for 1 Beck, on the corner of Beulah and Blackburn streets in the business section of the town.

About 2½ miles northeast of Hawkins E. C. Johnson is building derrick for 1 J. M. Green, in the John P. Mosely Survey. Hollandsworth Drilling Co. is preparing to start work at another location, this one about a mile west of Hawkins. It is 1 Bryan, in the Patton Survey. About 1¼ miles south of Hawkins Walter Goldston, Houston, is building derrick for 1 W. J. Harrell, H. S. Cobb Survey, just north of the Sabine River.

Numerous operators are seeking from one to seven permits for tests both in the townsite and on surrounding acreage. Plans are at present for a preliminary hearing on the spacing pattern for the townsite, said hearing to be at Hawkins on January 20.

Meanwhile official gage was reported for the original discovery well, Bobby Manziel 1 Morrison, 3½ miles norh of Hawkins. It made 144 bbl. of oil on a 24-hour pumping gage, 80 per cent of the fluid output being water. Production was through perforations in casing opposite the upper part of the Woodbine section.

Other Eastern Texas Activity

All but overshadowed by the Hawkins play, the other part of eastern Texas reported considerable interesting development during the week. One of the greatest setbacks to deep Travis Peak development in Limestone County since its start was suffered at the Gulf Oil and Farrell Drilling Co. 1 Frank Bevill, J. H. Murray Survey, in the Groesbeck area. The deep test has been shut down for several weeks awaiting the curing of titles before testing a promising oil show in the upper part of the Travis Peak section from 4,940-42 ft. During the week the zone tested only salt water and the hole was projected deeper to 5,500 ft. Gulf Oil Corp. had recently purchased half ownership in the test and its block of 18,000 acres from Frank Bryan of Waco for a reported consideration of $150,000 cash and a one-sixteenth override.

On the Keechi dome in Anderson County Texas Co. 1 Thomas B. Greenwood, a location announced the week previous, was spudded and started toward the Woodbine sand. The test is located about 7 miles north of Palestine and is on a structure which has been known for several years and which has been tested at various times during that period.

Freestone County was given a new wildcat location by C. W. Killough and E. B. Germany 1 K. Wollens on an 87-acre tract in the Ryan Survey, 2 miles east of Stewarts Mill. It is contracted to the Woodbine sand expected within 4,200 ft.

SUMMARY OF COMPLETIONS

Eastern Texas

	No.	Bbl.	Footage
Oil wells: Wildcats	2	3,054	9,564
Fields	2	246	8,359
Gas wells: Fields	2	*120	10,970
Dry holes: Fields	2	.....	6,332
Wildcat	1	.....	3,232
Total	9	.....	38,457

*M.c.f.

EASTERN TEXAS COMPLETIONS

(24-hour gages)

Anderson County

Long Lake field: F. H. E. Oil 1 Morrow, 115,000,000 cu. ft. gas, 10 bbl. distillate per M.c.f., 5,300-04 ft., perf.

Harper & Turner 1-B Laper, 138 bbl. fluid, 20 per cent water, ½-in. choke, 4,038-40 ft. and 4,062-68 ft., perf.

Franklin County

Talco field: Talco Asphalt Co. 3 Rutherford, 108 bbl., flowing in 4 hr., 4,256-91 ft.

Freestone County

Wortham field: McNeil Pet. 2 Simmons, dry at 500 ft.

Henderson County

Wildcat: W. R. Manning 2 Bell, D. Muckleroy Sur., 6 mi. SW Mabank, top Austin 2,695 ft., Woodbine 3,220 ft., dry at 3,232 ft.

Limestone County

Groesbeck field: C. L. Brown 1 Barron, 5,000,000 cu. ft. gas, 2 bbl. distillate per M.c.f., top Woodbine 3,295 ft., Georgetown lime 3,644 ft., Paluxy 4,124 ft., Glen Rose 4,170 ft., anhydrite 5,052 ft., base anhydrite 5,066 ft., Petit 5,568 ft., T.D. 5,666 ft.

Smith County

Chapel Hill field: Sun-Shell 1 Jack Walton, top lower Paluxy 5,700 ft., dry at 5,832 ft.

Wood County

Hawkins discovery wildcat: Bobby Manziel 1 Morrison, James Pollock Sur., 3 mi. N Hawkins, 144 bbl. net oil, 100 bbl. water, pumping, top Pecan Gap 3,139 ft., top Woodbine 4,789 ft., oil sand 4,903 ft.

Hawkins field: Jackson & Rotondi 1 Cobb, in Hawkins townsite, top Nacatoch 2,245 ft., Pecan Gap 2,954 ft., Austin 4,075 ft., Woodbine 4,398 ft., T.D. 4,648 ft., 363 bbl. in 3 hr., or rate of 2,904 bbl. daily.

EASTERN TEXAS WILDCAT REPORT

Anderson County

R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, 5,000-ft. test, top Woodbine sand 4,949 ft., prepare drill deeper.

Texas 1 Greenwood, M. Salisar Sur., 4 mi. NW Palestine, moving in material.

Fannin County

Damon Oil 1 A. L. Chaffin, SW cor. 85-acre tract, J. Ketcham Sur., 4 mi. NE Bonham, location cleared, prepare move in materials.

Freestone County

C. W. Killough and E. B. Germany 1 Woolens, J. Ryan Sur., 9 mi. N Fairfield, drilling 90 ft.

Hill County

Rush & Sanders 1 Hutchinson, L. W. Williams Sur., 2 mi. SW of Mt. Calm, S.D. 570 ft.

Hopkins County

L. A. Rankin 1 Chapman, Francis Hopkins Sur., Glen Rose 4,660 ft., anhydrite 4,950 ft., massive anhydrite 5,040 ft., base massive 5,160 ft., drilling 5,170 ft.

Kaufman County

T. G. Shaw, trustee, 1 Agnes Wynne, B. S. Newman Sur., 8 mi., E of Kaufman, lower Trinity test, S.D. for high water, 6,454 ft.

Lamar County

T. M. Parmly 1 C. H. Townsend, J. S. Porter Sur., 1½ mi. N of Chicolo, S.D. 1,612 ft.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 645 ft.

Limestone County

Farrell Drlg. and Gulf Oil 1 F. Bevill, J. H. Murray Sur., 1 mi. SW of Horn, Travis Peak 4,892 ft., top sand 4,392 ft., base sand 4,940 ft., perf. casing 4,932-40 ft., open 1 hr. and 43 min., recovered 4,880 ft. salt water, prepare to drill deeper to 5,500 ft.

Hardin & Ames 1 Hammond, J. Folk Sur., 1½ mi. NW of Kosse, top Austin 2,765 ft., Woodbine 3,210 ft., Buda 3,359 ft., Georgetown 3,490 ft., Paluxy 4,220 ft., Glen Rose 4,290 ft., perf. casing in gas zone 5,805-10 ft. and 5,776-92 ft., bailed only salt water. S.D.

Navarro County

J. R. Bunn 2 Cheney, J. White Sur., 3 mi. SE Navarro, rigging up.

Hargrave Oil 1 C. S. West, M. Boren Sur., 1½ mi. S Richland, drilling 300 ft.

Rains County

Plains Prod. 1 W. D. Foster, T. Cummings Sur., 1 mi. NW Alba, drilling 2,496 ft.

Red River County

J. F. Morrissey 1 Tyler, James Miro Sur., 3½ mi. SE of Bogota, 5,000-ft. test, S.D. 2,910 ft.

Smith County

O. L. Ross 1 Dr. Willingham, J. Herrin Sur., 2 mi. E Whitehouse, 10-in. at 110 ft., prepare to drill ahead.

Trinity County

R. W. Burnett 1 Southern Pine Lumber Co., G. Ricardo Sur., 2 mi. N Apple Springs, derrick up.

R. W. Burnett 1 Trinity Lumber Co., J. Hanley Sur., 1 mi. W Groveton, S.D. 1,713 ft.

Wood County

Delta Drlg. Co. and Sells Pet. 1 Beckham, G. W. Cowan Sur., 4½ mi. NE of Mineola, S.D. 1,448 ft., to clear titles.

Bobby Manziel 1 Bell, 31-acre tract on E side of Wideman Sur., ¾ mi. NW of Hawkins, gas blowout est. 50,000,000 cu. ft. daily from sub-Clarksville sand, T.D. 4,360 ft., still uncontrolled and blowing wild.

Hollandsworth Drilling Co. 1 Robin, George Brewer Sur., Lots 16 and 17, in Hawkins townsite, Reese Addition, drilling 1,250 ft.

Hollandsworth and C. W. Johnson 1 Lynch, Lots 18 and 19 in Hawkins townsite, 200 ft. W of No. 1 Robbin, building derrick.

Hollandsworth 1 Bryan, C. M. Patton Sur., 1½ mi. W Hawkins, 467 ft. from N and E lines of survey, location.

W. L. Goldston 1 Osborne, H. S. Cobb Sur., 1 mi. SE Hawkins, 330 ft. from N and E lines of survey, location.

Roger Lacey 1 Beck, Brewer Sur., in Hawkins townsite, E offset to Rotondi discovery well, moving in material.

E. C. Johnson 1 J. M. Green, John P. Mosely Sur., 3 mi. NE of Hawkins townsite, SW cor. of E 80 acres of the 160-acre tract, moving in material.

Rocky Mountain Area

(Continued from Page 77)

McKinley County

Ambrosia Investors Co., Inc., 1 Govt. SE SE 11-14n-10w T.D. 1,600 ft., underreaming 8-in. from 1,362 ft. to bottom.

San Miguel County

Southwest Drilling, Inc., 1 Conchas NW NE 34-17n-21e Recementing 8¼-in. at 2,635 ft.

Torrance County

Orville J Lee 1 Milburn.....C NW SW 36-7n-7e Rigging up.

J. P. Stewart 1 Laman.....C NW NE 3-3n-12e Drilling 710 ft.

UTAH

Box Elder County

Northern Oil 1.....NE SW 17-13n-4w Resumed at 386 ft. and drilling ahead at 475 ft.

Summit County

Longwell Pet. Co. 1.....SE SW SE 35-3n-5e S.D. 3,525 ft. for drilling line after setting 4¾-in. at 3,492 ft.

California Fields

(Continued from Page 74)

very shortly in Santa Maria Valley field. The west side of the field, which is nearest the ocean, is showing serious water trouble. Water trouble first showed itself in the area around the Fred Cole wells on the west side. Development of two wells on the Breneiser lease in the southwesterly portion of the field is said to have brought on a lot of water trouble. It is claimed that due to the speed in trying to get the production of oil out of the ground, some of the wells flowed approximately 1,000 bbl. per day and pulled the water in. However, operators are trying to correct this condition and prevent the water from working its way into the producers not yet infiltrated. It is an interesting problem and Union Oil Co. and Pacific Western are reported to be ready to start work along corrective lines shortly.

COASTAL DISTRICT COMPLETIONS

Del Valle Field

R. E. Havenstrite 2 Lincoln.....16-4n-17w Flowed 2,500 bbl., 36.5 gravity, 0.8 per cent cut, 2,400,000 cu. ft. gas; 1-in. bean; pressures 500/1,000 lb.; elev. 1,580 ft.; T.D. 6,221 ft.; 8⅝-in. water string 6,037 ft.; 210 ft. 6⅝-in. liner 6,220 ft.; perf. 6,037-6,220 ft.; 5,910 ft. 2½-in. tubing. This is second completion in Del Valle field. Located northwestern section of Los Angeles County, in close proximity to Ventura County line.

Ojai Field

Ivorwood Oil Co. 4 Coronet.....17-4n-21w Flowed 38 bbl., 30.5 gravity, 4 per cent cut, 50,000 cu. ft. gas; 7/64-in. bean; pressures 100/300 lb.; elev. 465 ft.; T.D. 3,250 ft.; 8⅝-in. water string 441 ft.; 3,247-ft. blank 5½-in. combination string; perf. 2,785-3,090 ft., 3,130-3,247 ft.; 3,000 ft. 2½-in. tubing. Completed in Calumet zone; 52 days' drilling time. Ventura County.

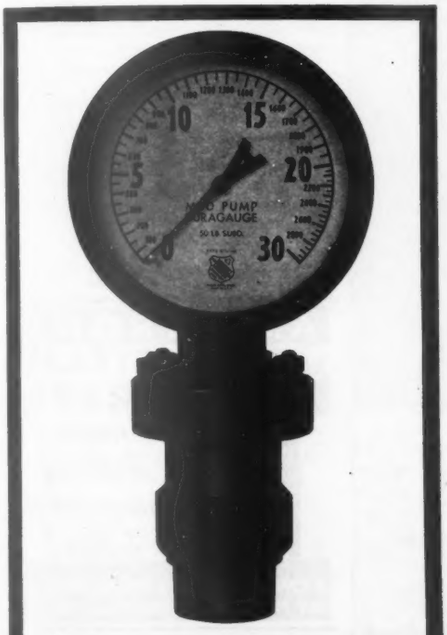
Ventura Avenue Field

Shell 128 Taylor.....29-3n-23w Flowed 3,254 bbl., 30.1 gravity, 3 per cent cut, 2,157,000 cu. ft. gas; 2-in. bean; pressures 250/1,350 lb.; elev. 246 ft.; T.D. 7,950 ft.; 7⅝-in. water string 6,660 ft.; 1,305 ft. 5½-in. liner 7,947 ft.; perf. 6,667-6,796 ft., 6,841-6,991 ft., 7,036-7,606 ft., 7,641-7,772 ft., 7,857-7,947 ft.; 7,763 ft. 2½-in. tubing. This largest well in Ventura Avenue field in a number of months; 54 days' drilling time. Ventura County.

COASTAL DISTRICT WILDCAT

Huasna District

Harvey Oil Corp. 1 Huasna.....11-32s-14e T.D. 4,520 ft. Rig to pump. San Luis Obispo County.



MUD PUMP DURAGAUGE

For all pressures up to 10,000 lbs. Fluid-filled system. Stainless Steel bulb. No water or mud can get into gauge mechanism. Compensated for temperature. Dampened for pressure pulsations. Easy to read. 1% accuracy guarantee. Heavy steel construction. Non-breakable front. 2" male connection. Send for descriptive circular—order from your DURAGAUGE Distributor.

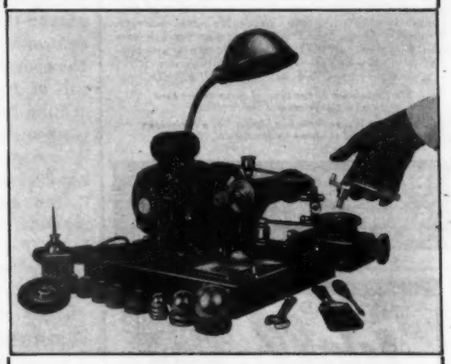
Branch stocks in Tulsa and Los Angeles. Other branches in Dallas, Houston, Corpus Christi, New Orleans, New York, Chicago, Detroit.

ASHCROFT GAUGES

MANNING, MAXWELL & MOORE, INC.
BRIDGEPORT CONNECTICUT

—YOU—

Better buy now and grind your own BALL VALVE SEATS.
The same seat can be reground as many as ten times and you save $1.00 each time.
Steel prices are upward and now is your time to conserve on valve purchases.



Details upon Request

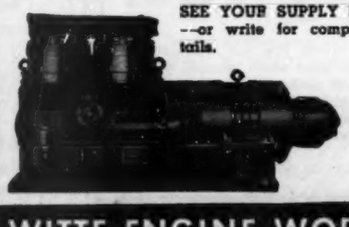
THE BALL VALVE SEAT GRINDER CO.
204 North Beech Street
SYRACUSE, NEW YORK

POWER and LIGHT for Less Than 1¢ a K.W.H.
The New
30,000 Watt–40 H.P.
WITTE
DIESELECTRIC
PLANT

This new and larger WITTE sets a high standard for dependable extra power at low cost—less than 1 cent a K.W.H. And you pay for only the current produced and used. Gives you the same famous engineering features that have made WITTE small Diesels outstanding leaders. Tested and performance proved. Ready to serve you where ever you set your rig. Operates on cheap, non-explosive fuel. Easily operated.

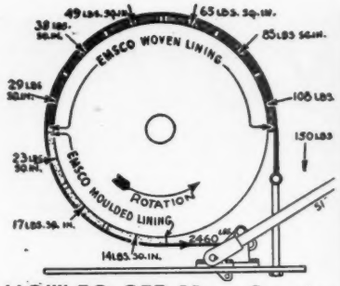
Other WITTE Diesels—2500 to 30,000 watts; 4 to 40 H.P.; Vertical or Horizontal, 1, 2 and 4 cylinders. Manual, Electric or Full Automatic Control. Compact, rugged. Practically no wear out. Backed by 70 years of reliability.

SEE YOUR SUPPLY DEALER —or write for complete details.



1981 OAKLAND AVENUE

WITTE ENGINE WORKS
KANSAS CITY, MISSOURI



HOW TO GET *More Service* OUT of YOUR BRAKE LININGS!

BRAKING pressure is not the same at each point on the band. To meet this problem, Emsco "Engineered" Rotary Sets deliver a combination of braking action. Where pressures are lighter, the Moulded blocks deliver abrasive action that prevents scoring. Where pressures are heavier, Woven is applied and delivers safe, smooth certain stopping. BOTH braking elements are specially developed to work in combination . . . Woven + Moulded = "ENGINEERED."

The combination of two types of lining on one band is an exclusive patented Emsco feature.

For the best Woven or the best Moulded, or a combination of the two - - - Buy Emsco.

EMSCO "Engineered"
(PATENTED)
Rotary Brake Lining Sets
EMSCO ASBESTOS CO. • DOWNEY, CALIF.

"PRE-SOLD"
Wall
MANILA
OIL FIELD CORDAGE
stands the gaff!

WALL MANILA ROPE

Complete stocks are carried in both mid-continent and gulf coast fields.

WALL
Wall Rope Works, *Inc.*
2000 Nance Street,
Houston, Texas
***Telephone*: Cap. 0244**

NEW TESTING METHOD INSURES 100% UNIFORMITY IN MacCLATCHIE "MONEY-SAVERS"!

From end to end the finished bore on a MacClatchie Pump Liner is 100% uniform, *with no soft spots to cause pitting!*

That's because MacClatchie has perfected an entirely new and exclusive method of testing the entire inside surface of "Money-Saver" Liners before they're shipped. This test checks the entire liner surface after grinding and reveals any soft spot which would pit and cause premature wear.

Thus, when you use MacClatchie Liners in your slush pumps, you're assured of getting the same uniform money-saving service day after day and month after month! Order a set for your pumps today!

Write for Complete Details

MacCLATCHIE MANUFACTURING CO.
COMPTON, CALIFORNIA

Among the Drilling

EARL HOLLANDSWORTH Drilling Co., Longview, Tex., is drilling or planning to drill at least three tests in the recently opened Hawkins field in Wood County, eastern Texas. The operator's 1 Robbin, in the townsite of Hawkins, was last reported drilling below 1,700 ft., while derrick is being erected for an offset test to the west in an adjoining townsite lot. The operator's 1 Bryan, in the Patton Survey, about 1 mile west of the town of Hawkins, will be started in a few days. The operator and drilling contractor is using his own rigs for the tests.

MORRIS HAMILTON Drilling Co., Houston, Tex., was opening gas-distillate production from the Wilcox sand in Colorado County, Texas, as W. R. Davis Co., Inc., 1 Brownston in the Garwood area, was showing for a producer while testing at 9,400 ft. In the Weser area, Goliad County, Texas, material is being moved in for 1 Webb, an outpost well which will be drilled for the same company.

LOFFLAND BROTHERS, Tulsa, have contract for the Pan American deep test rigging up in Willacy County, Texas. This well, 1 G. C. Kent, is 467 ft. out of the southeast corner of the 438-acre Kent ranch in Lot 8, Share 13, San Juan de Carricitos grant. The hole is scheduled for 10,000 ft.

ALLEN & MORRIS, San Antonio, Tex., received contract for a workover job in the Luby field, Nueces County, Texas, for Seaboard Oil Co. In the new Willamar field, Willacy County, Texas, Pan American 1-B Willamar Community is drilling below 5,600 ft., while in the West Ranch field, Jackson County, one rotary is running for Blutch Oil Co.

J. B. DAVIS, Fairfield, Tex., drilling contractor, has been let contract by C. W. Kilough of Mexia, and E. B. Germany of Dallas for a wildcat test in Freestone County, East Central Texas. It is 1 Woolens, in the J. Ryan Survey, about 9 miles north of the town of Fairfield. At last reports it was drilling below 90 ft. and preparing to halt to cement surface casing.

TIDEMAN & FRANKLIN, Houston, Tex., opened a new field in Calhoun County, Southwest Texas, approximately 9 miles south of Port Lavaca as McSpadden 1 Clark was showing for a producer while testing at 5,800 ft. The well is bottomed at 6,240 ft., and two promising sands are reported to have been cored.

WHITE EAGLE Drilling Co., Jefferson, Tex., a firm composed of Helmerich & Payne Drilling Co., Tulsa, and Ed V. Parsons, Jefferson, is drilling a 7,000-ft. wildcat test in Marion County, East Texas border. It is 1 T. W. Hook, Alexander Albright Survey. The test has been idle for several days after finishing first contract to the Paluxy sand at 5,006 ft., however, new acreage sales out of the operators' block has started it ahead toward the lower Trinity series and 7,000 ft. A heavier rig will be moved on to finish the lower 1,500 ft. of the hole.

GEORGE ECHOLS, Houston, Tex., started drilling operations on his 1 Hardison, a projected Wilcox test located in the Cypress area, Harris County, Texas Gulf Coast. In the coastal Louisiana district, 1 Marrero, a prospective pool opener located in the Westwego area, Jefferson Parish, Louisiana, is nearing the expected pay sand, while in Iberville Parish, and located on the St. Gabriel prospect, 1 Natalbany Lumber Co. is still shut down due to high water.

GRAY & WOLFE, Houston, Tex., are reported to have resumed drilling at Superior Oil Co. of California 1 McWhorter, a wildcat located in the Magnolia area, Montgomery County, Texas Gulf Coast. The well is attracting much interest as slight showings of oil and gas are reported to have been cored in the Wilcox formation.

SAM HENDERSON, drilling contractor of Baird, Tex., has been let contract for deepening a long-standing wildcat in Callahan County, West Central Texas. B. C. Mann, San Angelo, has taken over the old C. D. Hagerty 1 Windham, NW SE Section 154, G.H.&H. Survey, and let contract to deepen from its present depth of 1,002 ft. to 1,250 ft. and deeper if structure should check favorably.

CROW Drilling Co., of Shreveport, La., are rigged up on 1 Smart, a Smackover lime wildcat they are drilling for Turner & O'Farrell in the old shallow Stephens pool, Columbia County, South Arkansas.

GEORGE LIVERMORE, independent operator and owner of the Livermore Drilling Co., Odessa, Tex., has staked location and is moving in ma-

WHEREVER YOU ARE . . .

THE CAVINS IS READY *for that CLEAN-OUT JOB*

The Cavins Hydraulic Suction Bailer & Fishing Tool The Cavins Perforation Washer and The Cavins Screen Cleaner have long been recognized for their superior performance on clean out jobs - - - they do the job right in less time, at less money.

Cavins rental and service agencies are located in key cities to enable prompt, efficient service in all major fields. Do the job right - - - call for the Cavins.

Rental and Service Agencies

CALIFORNIA
Bakersfield Telephone 1779
Taft Telephone 870
Ventura Telephone 6767

TEXAS
Odessa Telephone 235
Corpus Christi Telephone 8906
Houston Telephone W-1451

LOUISIANA
Lake Charles Telephone 3311

KANSAS
Hoisington Telephone 406

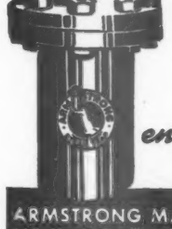
WYOMING
Lance Creek P. O. Box 54

COLORADO
Denver Telephone KE-4514

INDIANA
Griffin care Joe Bander
Evansville Telephone 2-8407

THE CAVINS CO.
2853 Cherry Ave., Long Beach, Calif.
Phones 414-14 & 414-60

ARMSTRONG
STEAM TRAPS
make drilling engines work better!



ARMSTRONG MACHINE WORKS
568 Maple Street Three Rivers, Michigan

GATKE
DEEPWELL WOVEN
BRAKE LINING
The drillers best friend. Stands the gaff. Sure holding action. Even feed-off. Prolongs flange life. Ask GATKE Field Men.
GATKE CORPORATION
228 N. LaSalle St., CHICAGO

Contractors

terials for a new wildcat test in the Waples-Platter area just northeast of the Bennett sector of the large Wasson field in Yoakum County. The wildcat will be 1 Ernest Ownby, 660 ft. from the north and east lines of Section 502, Block D, Gibson Survey, 3 miles north and ¾ mile east of the Livermore (formerly Sloan & Zook and T. N. Sloan) 1 Waples-Platter, first flowing well and second producer for the area.

CROSBY Drilling Co., Houston, Tex., had reached a depth of 8,144 ft. in Strake Petroleum Co., Inc., 1 Griffith, a wildcat located southwest of the Alta Loma field, Galveston County, Texas Gulf Coast. Drilling was temporarily halted due to an attempted blowout. In Lavaca County, Texas, the company continues to await favorable weather conditions before making a production test of M. McMurray 1 Allen, a prospective Wilcox pool opener located about 11 miles east of Halletsville.

HOUSH & THOMPSON, Houston, Tex., recompleted Phillips 1 Houston Farm Development Co. at Chocolate Bayou, Brazoria County, Texas, and the well is reported to be showing gas and distillate while cleaning out from perforated casing at 9,675-77 ft. Drilling is expected to be started on another well in the Greens Lake field, Galveston County, Texas Gulf Coast, following the completion of Sun Oil Co. 11 Hughes which extended the field and opened a new sand. Other activity is reported at the Edgerly field, Calcasieu Parish, Louisiana, for the Gulf Refining Co., and at the Sorrento dome, Ascension Parish, for William & King.

DUNIGAN & BRAHANEY, Fort Worth, Tex., drilling contractors, have been let contract by Roeser & Pendleton, Inc., Fort Worth, and Merry Brothers & Perini, Abilene, for a new Delaware sand test in the Bird Hayes field of Ward County, West Texas. It is to be ¼ mile north of the discovery gas well for the area opened in the early part of last year and will be 467 ft. from the southeast and southwest lines of Section 164, Block 34, H.&T.C. Survey. Contract depth is 5,200 ft. and contractor is moving in rotary equipment for immediate drilling.

ROBEY Drilling Co. has sold its tools and equipment to Anthony F. (Tony) Keating, Salem, Ill., according to an announcement made last week by Mrs. R. D. Robey, Jr., who has headed the firm since the death of her husband in a car accident last August. The firm will be known as the Robey-Keating Drilling Co. with Mr. Keating in complete charge of the business. Four rotary-drilling rigs have been operated in Illinois by the Robey company for the past several years, Robey being one of the pioneer rotary-drilling contractors in the area. The firm also operates a cable-tool machine in Kansas. Mr. Keating is a graduate of Holy Cross University and a native of Pittsburgh, Pa. He was employed by the Frick-Reid Supply Corp. until about a year ago when he quit to gain first-hand knowledge of the drilling business through working on a drilling rig. Since October 1940, Mr. Keating has been connected with Robey Drilling Co. The new organization will maintain offices in Tulsa and Salem, Ill. Fred McAlpin, who has been tool-pusher for Robey Drilling Co. since its organization, will continue in charge of the drilling rigs.

Robert A. Stacy on January 1 resigned his position of vice president of Delta Drilling Co., Shreveport, La., to enter drilling contracting for himself. His offices will be established in the Commercial Bank Building, Shreveport. Mr. Stacy is well known in the Mid-Continent. In 1930 he organized the Delta Drilling Co. in Dallas, Tex. Delta rigs completed the discovery well of the Schuler field, Union County, Arkansas, and the Texas extension of Rodessa in Cass County. Recently the company drilled No. 1 Dunn, and opened a new gas field in western Caddo Parish, North Louisiana. Mr. Stacy entered the oil business in El Dorado, Ark., in 1926 as a superintendent for El Dorado Gas Co. He later entered the oil business for himself in South Arkansas, before forming the contracting company. He is married and has one son, Robert A. Stacy III, who is a cadet at New Mexico Military Institute, Roswell, N. M.

ARROW Drilling Co., Tulsa, at a wildcat in Okfuskee County, Oklahoma, last week opened the first field of the state for the new year at 1 Dudgeon, owned by Arrow, J. P. Walker, Keener Oil & Gas Co., J. H. Harvey and Selden Henry. Located 10 miles northwest of Okemah, in NE SW SE 36-12-9e, the test found oil in the Gilcrease at 3,084 to 3,110 ft. and at the first of the week was still testing. One flow of 65 bbl. in 1 hour was reported. Originally the test was drilled to 4,126 ft. in the Wilcox sand, which contained water, and was plugged back to the Cromwell sand which also was unproductive.

W. G. WALTON, San Antonio, Tex., has apparently opened the first commercial production in Dimmit County, Texas, as preparations were made to complete Producers Corp. of Nevada 1 McKnight, a wildcat located west of Carrizo Springs. Casing was cemented for completion following a drill-stem test in the Navarro sand which recovered 30-gravity oil.

HENSHAW BROTHERS, San Antonio, Tex., started drilling operations on their 1 Gonzales, a projected 6,000-ft. wildcat located northwest of Premont in Duval County, Texas.

LEONARD BLOOD, drilling contractor of Bangor, Mich., after encountering difficulty in setting the production string at Boswell and Blackmer 1 Cousins, ½-mile-west extensioner to the Adams pool of Arenac County, Michigan, at the first of the week was testing prior to completion. Hole was rebottomed at 2,093 ft., at which depth the well carried a hole full of oil and made at least one flow (natural) from the Traverse lime. Location of the 1 Cousins is SW SE NE 27-19n-3e.

GENERAL WELLS SERVICE, drilling concern of Tyler, Tex., is preparing to spud Texas Co. 1 Thomas B. Greenwood, a wildcat test on the Keechi dome area 5 miles northwest of Palestine, Tex., in Anderson County. The test will be carried to the Woodbine sand, expected at about 5,500 ft. Location is 1,660 ft. from the south line and 990 ft. from the east line of a 377-acre tract in the M. Salasar Survey.

CHIKSAN
All-Steel
ROTARY
HOSE

Unlimited flexibility assured by 17 swivels, turning smoothly on double rows of hardened steel balls in flame-hardened races. All-steel construction does not deteriorate with age or climate. 3", 4" and 5" sizes. 45' to 60' lengths.

Distributed in Texas, Louisiana, Arkansas and New Mexico by GULF ENGINEERS, INC.

Distributed in Oklahoma and Kansas by WELL EQUIPMENT MFG. CO.

CHIKSAN TOOL COMPANY
BREA, CALIFORNIA

BALL BEARING SWING JOINTS for ALL PURPOSES
ALL-STEEL ROTARY HOSE
CIRCULATING HEADS • MUD GUNS
THREE-WAY DISC BIT
STANDARD AND HEAVY DUTY REAMERS

The
H. C. SMITH
T-39
wire line
CORE DRILL

HARD FORMATION CUTTER HEAD

H. C. SMITH T-39 WIRE LINE CORE DRILL

SOFT FORMATION CUTTER HEAD

Export Representative:
VAL R. WITTICH
30 Rockefeller Plaza, New York City

H C Smith Oil Tool Co.
GENERAL OFFICES AND PLANT
P. O. Box 431, Compton, Calif.

By
R. MARNE SANFORD

New Fields Found in Young And Wilbarger Counties

WICHITA FALLS, Tex., Jan. 6.—The new year started off well in North Texas as a new field was discovered in Young County and a new and third producing horizon opened in the Fargo field of Wilbarger County. To carry the past year's wildcatting on into the new year, deep exploratory holes were located in Clay and Baylor counties and a shallow wildcat was staked in Wichita County.

The Young County discovery is Kerlyn Oil Co. and Phillips 1 Tiffin, located 851 ft. from the south and east lines of Section 1951, T.E.&L. Survey. Having been in the stages of plugging back and testing for several weeks the well was the past week officially completed for 458 bbl. of oil daily. Pay was from 2,920 to 2,953 ft. No new development has been indicated for the area as yet.

In Wilbarger County Amerada Petroleum Corp., discoverer of the Fargo field, has opened a new and the third pay horizon for that field. The company's 1-B Dodson, Section 345, Block 15, H.&T.C. Survey, was reported flowing approximately 47 bbl. of oil each 2 hours, based on several short flows. Having been drilled to a total depth of 4,415 ft., the new pay level was found by perforating casing from 3,982 to 4,002 ft. The original discovery horizon for the field was at about 3,250 ft. while the second and deepest level was opened in November of 1940 by the firm's 1 Parker at 4,404-77 ft. Amerada Petroleum Corp. plans to stake locations for several additional tests in the field during the early months of this year, there now being three pays found at various points and perhaps universally throughout the field.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Hull-Silk	9	7,420	39,791
Holliday field	2	15	2,679
Thornberry field	2	20	402
T.C.U. field	2	50	2,152
Voth field	4	701	5,542
Walnut Bend field	4	2,089	19,017
Rogers & Rogers field	2	2,053	10,685
Bonita field	2	3,426	10,914
K.M.A. field	3	2,207	11,446
Olney field	3	165	2,584
Wildcat discovery	1	458	2,953
Other fields	8	3,099	24,036
Dry holes: Fields	12	.....	14,175
Total	54	.....	146,376

West Central Texas

Oil wells: Fields	5	952	13,962
Wildcat discovery	1	210	2,342
Dry holes: Fields	2	.....	5,263
Wildcats	3	.....	7,375
Total	11	.....	28,942

New Wildcat Locations

In Clay County Bridwell Oil Co., Wichita Falls, has located 1 Mrs. W. H. Meyers, SW part of the C. Thompson Survey, Abstract 444, out of the 2,100-acre block held by the company. It is contracted to 5,500 ft. and will be drilled immediately. The nearest production is the five-well Browning field opened in 1939 by L. T. (Bobby) Burns 3 miles to the northwest. Production in the Browning field is from the 4,400-ft. Strawn level. The new location is about 1 mile south of the old Nebraska Oil 1 Myers which was abandoned several years ago after testing for production from a promising sand at 3,340 ft. The wildcat is also about 1½ miles north of the 5,302-ft. failure drilled by L. T. Burns on the Wynn lands, Hiram Williams Survey, last year.

Baylor County's new wildcat is L. T. Burns 1 fee, a 4,500-ft. test located about 4 miles east of the town of Dundee in northwestern Archer County. It is 467 ft. from the south and west lines of NE¼ Section 73, T.&N.O. Survey, on a block of 1,200 acres.

In Wichita County Lonnie Huddleston of Wichita Falls has staked location for 1 H. Glass, a 1,350-ft. test 12 miles northeast of the town of Wichita Falls and 150 ft. from the south and east lines of a 26-acre tract in the B.B.B.&C. Survey, Abstract 28.

Jack Discovery Deepening

Jack County's new Ellenburger and Mississippian lime field opened last week has not confirmed early predictions and the discovery well, Continental Oil 1 Robertson, is now being rigged up for deepening. Located in the M. J. Swan Survey, Abstract 1650, the test has flowed 104 bbl. daily from the lower Mississippi lime from 5,340 to 5,370 ft. and from the upper Ellenburger lime from 5,370 to 5,386 ft. With a total depth of 5,386 ft. and 5½-in. casing cemented at 5,343 ft., work was under way to deepen it at the close of the week. The well's production had dropped to 46 bbl. of oil in 12 hours.

NORTH TEXAS COMPLETIONS

Archer County

Hull-Silk field: Cox & Hamon 1 Anderson Norwood, 95 bbl., 4,386-4,435 ft.
Cox & Hamon 1 Anderson Weeks, 40 bbl., 4,400-4,425 ft.
Dillard, White & Duncan 13 Nichols, 960 bbl., 4,335-4,400 ft.
Gulf 24 Siegel, 72 bbl., 4,577-4,666 ft.
Helmerich & Payne, Inc. 1 Jones, 2,016 bbl., 4,606-18 ft.
Helmerich & Payne, Inc. 2 Wilmot, 2,100 bbl., 4,613-44 ft.
W. H. Peckham 3 Krebs, 840 bbl., 4,355-88 ft.
Petroleum Prod. 4 Anderson, 1,091 bbl., 4,362-4,425 ft.
Sinclair Prairie 1 Jones, 181 bbl., 3,770-90 ft.
Holliday field: L. T. Burns 2, 3, 4, 5, 6 Wilson-McCrory, abandoned locations.
Deep Oil Dev. and Christie 5 Finley, 30 bbl., 1,306-16 ft.
Bert Ligon 10 J. A. Little, 10 bbl., 1,360-63 ft.

Clay County

Halsell field: Bridwell Oil 7 Halsell, 185 bbl., 4,718-44 ft.
Petrolia field: British American 2 Stine, dry at 1,831 ft.
Thornberry field: Burns 7 Hamilton, 10 bbl., 267-75 ft.
Johnson & Kouri 4 Taylor, 10 bbl., 111-27 ft.
L. W. Stanford 1 Jones, dry at 510 ft.
Antelope field: Shell Oil 2 Henderson, 1,712 bbl., 3,190-3,260 ft.

Cooke County

T. C. U. field: C. J. Bohner 1 Fette, 40 bbl., 1,075-86 ft.
C. J. Bohner 2 Fette, 10 bbl., 1,060-66 ft.
Voth field: Humble 9 Heilman, 303 bbl., 1,248-80 ft.
Humble 1 Streng, 37 bbl., 1,316-20 ft.
Whitfield, Pearson & Grimes 4 Sicking, 246 bbl., 1,241-71 ft.
Whitfield, Pearson & Grimes 11 Voth, 115 bbl., 1,660-71 ft.
Walnut Bend field: Sun 9 Snuggs, 655 bbl., 4,898-4,911 ft.
Sinclair Prairie 2 Atkins, 606 bbl., 4,976-5,002 ft.
Sinclair Prairie 2 Hudspeth, dry at 4,347 ft.
Sinclair Prairie 17 McGeorge, 260 bbl., 4,076-4,281 ft.
Sinclair Prairie 3 Timmis, 568 bbl., 4,909-13 ft.

Foard County

Allee field: Foster Pet. 1 Belle Allee, 51 bbl., 2,352-72 ft.

Jack County

Mathis field: Hanlon-Buchanan 1 Smith, 155 bbl., 2,875-95 ft.
Bloodworth field: T. C. Jones 12 Smith, 6 bbl., 366-80 ft.
Bryson field: Kimbell & Bohner 1 Shoun, 30 bbl., 3,050-70 ft.

Montague County

Rogers & Rogers field: Carnation Oil 1 Baker, 1,072 bbl., 5,383-96 ft.
Stanolindi Oi & Gas 3 McCool, 981 bbl., 5,203-89 ft.
Bonita field: Sinclair Prairie 1 Bonita SE unit, 1,922 bbl., 5,416-59 ft.
Sinclair Prairie 2 Bonita W unit, 1,504 bbl., 5,297-5,455 ft.

Wichita County

K. M. A. field: Consolidated Oil 2 Barnes, dry at 4,025 ft.
Consolidated Oil 1 Barnes, abandoned location.
Magnolia 5 Barton, 275 bbl., 3,764-3,825 ft.
Sunray Oil 12 Mangold, 1,120 bbl., 3,697-3,831 ft.
Venmex Oil 16-A State, 812 bbl., 3,770-90 ft.
S. S. Hill field: J. W. Gookin 1 Foster, dry at 1,260 ft.
Burkburnett field: Hall-Jordan 5 Warren, dry at 610 ft.
A. C. Parks 2 Roller, dry at 633 ft.

Wilbarger County

Fargo field: Amerada 1 Folley, 400 bbl., 4,455-4,508 ft.
Electra field: A. E. Blair 1-A Scott, dry at 601 ft.

Young County

Olney field: Burns 1 Leberman, dry at 891 ft.
Cato Bros. 1 Hamilton, 10 bbl., 857-61 ft.
Harrell 6 Rogers, 150 bbl., 895-905 ft.
Henry 2 Morrison, dry at 975 ft.
Keith 2 Clark, dry at 950 ft.
Machman Oil 1 McCloud, dry at 955 ft.
Wildcat: Kerlyn Oil and Phillips 1 Tiffin, 458 bbl., 2,920-53 ft.
Knox field: Ray Oil & Nach 7 Bills, 560 bbl., 2,779-2,807 ft.
N. H. Martin 13 Hamilton, 5 bbl., 798-818 ft.
J. W. Sparks 4 Clark, dry at 934 ft.

NORTH TEXAS WILDCAT REPORT

Archer County

W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., 60-qt. shot 5,149-64 ft., cleaning out.
W. B. Omohundro 1 Browning, 467 ft. from S and E lines, Sec. 7, G.E.L. Sur., top Caddo lime 5,130 ft., 5½-in. 5,127 ft., T.D. 5,147 ft., W.O.C.
Shell 1 Coleman, 330 ft. to S and E lines of Lot 1, Sec. 74, A.T.N.C.L. Sur., top Gunsight lime 1,416 ft., drilling 4,380 ft.
Southern Pet. Exp. 1 Wilson A, 330 ft. W from railroad and 330 ft. from N line, Lot 4, Sec. 73, A.T.N. C.L. Sur., tight well, saturation reported from 4,014-40 ft., top Caddo 5,161 ft, 5½-in. 5,162 ft., show oil in lime 5,161-5,200 ft.
Walter Gant 1 Hunter, SE NW Sec. 7, Blk. 1, H.&T.C. Sur., top Ellenburger 5,370 ft., set 7-in. at 5,370 ft., T.D. 5,391 ft., waiting on spudder to drill plug.
W. B. Omohundro 1 Coleman, Blk. 52, Madison County School Lands Sur., drilling 5,514 ft.
Gibson & O'Donohoe 1 Jentsch, 330 ft. from N and E lines, H. Jentsch Sur., Abst. 995, 4,800-ft. test, drilling 4,805 ft.
Sam Kruger 1 Turbeville, 450 ft. from E and 389 ft. from S lines, NW Sec. 170, Robert Carson subd., 1,600-ft. test, spudding.
King Oil 1 Taylor, Lot 1, Sec. 13, A.T.N.C.L. Sur., show oil 4,190-91 ft., coring below 4,191 ft.
E. C. Harlin 1 Waggoner, 150 ft. from S and W lines, Sec. 30, Clark & Plumb subd., 1,250-ft. test, spudded and S.D.
White & Duncan 1 Snyder, 1,600 ft. from W and 750 ft. from N lines Lot 21, Thomas Toby Sur., Abst. 643, 750-ft. test, rigging up spudder.

Baylor County

Hattie B. Madden 2 J. J. James, Sec. 150, T.&N.O. Sur., show oil 1,352-63 ft., lost drill pipe at 2,308 ft., S.D.
Rogers & Lanfair 1 Howe, J. Howe Sur., Abst. 572, show oil 1,445-52 ft., S.D.O. 3,115 ft., T.D.

Clay County

F. H. Cohlke 1 Morgan Jones, 150 ft. from N and E lines of Lot 4, Graham subd. of Lot 46 in Parker C.S.L. Sur., drilling 1,410 ft.
Jack Kadane 1 Hamilton, 1,957 ft. from W and 1,565 ft. from S lines of Sec. 84, Byers Brothers subd., spudding.
Carlos Wagner 1 L. C. Thaxton, Sec. 2, T.&N.O. Sur., 6,500-ft. test, rigging up rotary.
R. H. Dearing 1 O. O. Ross, Sec. 8, J. Wyont Sur., Abst. 902, location.
Perkins & Cullum 1 Taylor A, 450 ft. from SW and 997 ft. from NW lines Sec. 44, Bacon subd., 1,500-ft. test, S.D. 1,026 ft.

Denton County

Amon G. Carter 1 W. P. and A. P. Allen, S. Westbrook Sur., drilling 7,355 ft.

Hood County

W. G. Martin 1 W. F. Thorman, E cor. of 2,956-acre ranch, F. F. Anderson Sur., 5,000-ft. test, spudded and S.D.
Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, T.D. 1,180 ft.

Jack County

Paul Steed 1 E. Haag, 2,489 ft. from S and 467 ft. from W lines of W 130 acres of 600-acre farm in Nancy Overby Sur., Abst. 452, drilling 3,390 ft.
Continental 1 Robertson, M. J. Swan Sur., Abst. 1650, lime, show oil 5,345186 ft., D.S. test recovered 240 ft. oil in 11 minutes, ran 5½-in. casing for test, top Mississippian lime 5,307 ft., base Mississippian 5,360 ft., top Ellenburger 5,380 ft., flowed 104 bbl. per day from 5,346-86 ft., oil flow declined, prep. to drill deeper.
R. A. Conkling 1 M. Hoffle, A. James Sur., Abst. 318, 3 mi. S of Antelope, 3,500-ft. test, T.D. 3,108 ft., fishing casing.
Rathke Oil 1 Moseley, J. Harrison Sur., Abst. 259, 1,500 M.c.f. gas 4,645-50 ft., drilling 5,340 ft.
K. N. Davis 1 Jones, NW cor. E½ Sec. 2555, T.E.&L. Sur., 1 mi. SE Perrin, 2,500-ft. test, derrick.
Noah Davis 1 Rankin, E½ Sec. 2555, T.E.&L. Sur., moving in materials.
Three Bee Investment Co. 1 Armstrong, 700 ft. from S and 1,200 ft. from W lines, Sec. 2, W. P. Blake Sur., Abst. 1598, 3,300-ft. test, S.D. 3,060 ft.
Harper-McClintock 1 Kinder, 1,400 ft. from E and 467 ft. from N lines, Sec. 2667, T.E.&L. Sur., drilling 657 ft.
O. J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines, H. C. Ayers Sur., Abst. 4, S.D. 3,505 ft.

Montague County

Walter Gant 1 Will Laird, R. T. Millard Sur., Abst. 470, 7 mi. W of Sunset, 6⅝-in. casing at 6,641 ft., oil sand 4,857-82 ft., T.D. 6,651 ft., P.B. to 6,596 ft., perf. casing 4,865-73 ft., swabbed 67 bbl. oil in 2½ hr., S.I. for 5 days and opened to swab 80 bbl. oil in 3½ hr., made total of 225 bbl. oil in 4 days, swabbing unit broke, S.D.
T. F. Hunter 1 Fatheree, L. S. Gilliland Sur., 3 mi. W Illinois Bend, 6,000-ft. test, T.D. 5,043 ft., P.B. 3,394 ft. and set 6⅝-in. casing at 3,384 ft., W.O.C.
Benson & Benson 1 Joe Benton, Abel A. Lewis Sur., 2 mi. SE of Ringgold field, 10-in. 508 ft., top Caddo lime 5,718 ft., S.D.O. 6,213 ft.

J. G. Hammond 1 Jester, 84 acre tract in E Wingate Sur., Abst. 835, 2 mi. W Mallard, 6,500-ft. test, top Caddo lime 6,282 ft., S.D. 6,505 ft.
Sinclair Prairie 1 W. G. Hawkins, 631 ft. from N and 330 ft. from E lines of farm in Sec. 17, H.&T.C. Sur., 3 mi. SE of Ringgold, spudded and S.D.

Parker County

Higginbotham 1 Gilbert, T.&P. Sur., Abst. 1958, T.D. 4,800 ft., fishing.

Tarrant County

Bruce Sullivan 1 W. C. Putnam, 200-acre tract in Milley Gilbert Sur., 6,500-ft. test, base Trinity 1,080 ft., drilling 6,080 ft.

Throckmorton County

Humble 1 Durham, Sec. 1627, T.E.&L. Sur., top Ellenburger lime 5,005 ft., drilling 5,240 ft.
Homer Moore and J. E. Dodson 1 J. O. Crump, Blk. 956, T.E.&L. Sur., location.
Humble 1 Allie McKnight, 1,100 ft. from N and 660 ft. from E lines Sec. 2, D.L.&C. Sur., Abst. 1264, 5,000-ft. test, location.

Wichita County

Big Six Oil 1 Edmonson, 150 ft. from N and W lines, Sec. 13, Red River Lands subd., 10-in. at 20 ft., T.D. 24 ft., drilling 1,070 ft.
Fred Browning 1 W. L. Warren, 996 ft. from N and 330 ft. from W lines, Sec. 32, W.V.F.L. Sur., S.D. 4,001 ft., prep. P.B. and test show oil 1,760-72 ft.
Golding & Cochran 1 D. R. Preston B, 2,970 ft. from N and 990 ft. from W lines, Sec. 26, Blk. 7, H.&T.C. Sur., 10-in. at 105 ft., saturation from 3,887-3,903 ft. and 3,939-41 ft., cemented 5½-in. at 3,897 ft., drilled plug and bailed down with show of oil, 300-qt. shot, no results, S.D. 4,083 ft.
Akin, Dimock & Costley 1 Dodson, 1,470 ft. from W and 150 ft. from S lines, Dodson farm in W. H. Anderson Sur., Abst. 1, 1,350-ft. test, location.
Harper & Knappenberger 1 Raming, 150 ft. from N and E lines, W½ of S 103 acres of N 203 acres of Raming 300 acres in Henry Hastie Sur., Abst. 92, 1,400-ft. test, drilling 1,100 ft.
King Oil 1 Ancell, 330 ft. from N and E lines of L. C. Gibbs Sur., Abst. 390, 4,000-ft. test, drilling 2,272 ft.

Wilbarger County

Consolidated Oil 1 Clifford Pollan, 187 ft. from W and 407 ft. from N lines of Sec. 9, Blk. 16, H.&T.C. Sur., drilling 4,375 ft.
W. H. Gant 1 Mock, Sec. 23, Blk. 11, H.&T.C. Sur., 6,000-ft. test, drilling 425 ft.
Big Six Oil 1 Morris, Sec. 3, Blk. 14, H.&T.C. Sur., show oil 2,895-2,907 ft., 7-in. 2,895 ft., T.D. 2,905 ft., testing est. 60 bbl. oil per day.
Ray Brothers 1 Henry Streit, 72-acre tract in S. N. Gosnel Sur., Abst. 1231, 1,800-ft. test, drilling 1,265 ft.
W. B. Omohundro 1 W. T. Waggoner, 1,100 ft. from E and 150 ft. from S lines of Sec. 49, Blk. 4, H.&T.C. Sur., 6⅝-in. 1,229 ft., show oil 1,229-47 ft., rigging up spudder.

Wise County

Cranfill & Rogers 1 McKay, Sec. 8, Falls C.S.L. Sur., coring pay 5,797-5,858 ft., drilling 6,520 ft.
Manahan Oil 1 E. R. Collier, J. M. Wade Sur., Abst. 868, drilling 5,860 ft.

Young County

E. Lennington 1 Perry, 165 ft. N of C of river and 46 ft. from W line of 126-acre A. W. Perry farm in Oliver T. Brown Sur., Abst. 25, S.D. 165 ft.
Ben H. Rankin 1 Mary Logan, SW part Blk. 2, J. W. Doty Sur., 8 mi. NE Graham, 2 mi. W Nelson field, small showing oil 3,575-3,600 ft., 5½-in. 3,565 ft., drilling plug and bailed dry, S.D. 3,613 ft.
Kimmell, Lee & Co. 1 Campbell B, 150 ft. from S and E lines of W 40 acres of N 40 acres of S½ Sec. 1371, T.E.&L. Sur., 1,100-ft. test, show oil 956-70 ft., testing.
B. C. Gilmore 1 Bagley, 210 ft. from E and 650 ft. from S lines of Leroy W. Ross Sur., Abst. 1352, 700-ft. test, location.
L. T. Burns 1 Bloodworth, 150 ft. from N and 783 ft. from W lines of Sec. 214, T.E.&L. Sur., 1,000-ft. test, location.
S. D. Glover 1 C. E. Luton, 150 ft. from S and E lines of J. L. Elmore Sur., Abst. 1421, location.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Jan. 6.—New development for the recently opened Kelso field in southern Jones County, together with several new wildcat locations for the district, started the new year off at an active clip in the West Central Texas district.

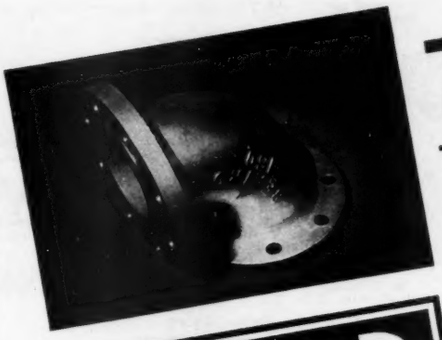
Two miles west of the Akard field in southern Jones County, Danciger Oil & Refineries 1 Kelso, Godwin Subdivision 82, De Witt County School Lands, has been officially gaged at 140 bbl. of oil in 16 hours, flowing, natural, from sand drilled from 2,336-42 ft. Danciger 2 Kelso, a northwest offset, has been staked 330 ft. from the west and 1,129 ft. from the south lines of the same section. A southeast offset, H. E. Gale, is 330 ft. from the north and 869 ft. from the east lines of N½ Lot 91, De Witt County School Lands. The field is about 14 miles northwest of the city of Abilene.

North of the Kelso field the Cook sand will be tested at a wildcat by T. D. Humphrey as 1 Willis Norwood, 2,310 ft. from the north and 330 ft. from the west lines of the 267-acre Norwood tract in Section 18, Block 15, T.&P. Survey.

Eastland County

In southern Eastland County a new outpost has been staked to the Dobbs field. It is G. A. White et al 1 Thomason, 330 ft. from the south and west lines of a 20-acre tract in the SE Section 35, Block 2, H.&T.C. Survey.

South of the Dobbs field, two wildcat locations were also staked during the week. J. H. Haynes of Eastland



75% HEAVIER
THAN A.S.A. STANDARDS

..... walls of even thickness..... finest acid electric steel ..... all flanges faced, turned and backfaced ..... and a score of other exclusive BEAIRD quality features you will be familiar with if you

WRITE FOR BULLETIN No. 50-B

This catalog presents in a nut-shell all the features, specifications, sizes and prices of BEAIRD Finished Steel Fittings.

BEAIRD
• FINISHED •
STEEL FITTINGS

The J. B. BEAIRD CORPORATION
Manufacturers of Steel Fittings, Refinery Vessels, Steel Derricks, Oil Field Equipment.
Shreveport, Louisiana, U. S. A.

A NEW BOOKLET Important to the Refiner

HOW IS Furfural made? Have you questions concerning its availability? What are the specifications under which Furfural is sold to oil refiners, and how it is used as a selective solvent? What are its physical properties? These and other questions are discussed in the booklet.

The Furfural Refining Process has a splendid record of successful operation. Several additional recent installations serve to remind those refiners not yet operating solvent processes that now is the time to investigate this modern method. Delay may be expensive. Start at once by getting a copy of this booklet.

The booklet entitled "Furfural As A Selective Solvent" is free to those who write for it. If you have specific questions, send them along, too.

The Quaker Oats Company
Technical Division—10-1, 141 WEST JACKSON BLVD., CHICAGO, ILLS.

REGISTERED PROFESSIONAL ENGINEERS
Air • Gas • Water
REPRESSURING
RECYCLING • PRESSURE MAINTENANCE
INSTALLATION • OPERATION
PETROLEUM ENGINEER
JO H CABLE
WICHITA FALLS TEXAS
GAS MEASUREMENT • PERMEABILITY
COMPRESSOR PLANTS • POROSITY
BOTTOM HOLE PRESSURE • SATURATION
GAS OIL RATIOS • RECOVERABLE OIL
CONTROL OF FLOW THRU FORMATION
REGISTERED PROFESSIONAL ENGINEERS

STEP AHEAD TO SUCCESS!

Reading important oil books is the surest route to success. For a FREE list of such books just address—

THE OIL AND GAS JOURNAL

staked a 3,000-ft. test as 1 Rufus, 330 ft. from the north and west lines of E½ SW Section 13, Block 3, H.&T.C. Survey.

Six miles southwest of the town of Carbon, W. L. Fetty of Eastland has located 1 W. M. Morgan, 233 ft. from the south and 995 ft. from the east lines of N½ P. Barnhill Survey 53. It is a 2,800-ft. cable-tool test.

Closely Watched Wildcats

Fisher County was given a new wildcat location late in the week when F. A. Stephenson staked 1 J. P. Humphries east of Sylvester and southeast of McCaulley. It is 660 ft. from the north and west lines of Section 49, H.T.&B. Survey, just south of the same operator's 1 Maberry, Section 58, Block 1, H.T.&B. Survey, which showed oil in drilling to 3,312 ft. but which has been shut down untested for several weeks.

In Callahan County B. C. Mann, San Angelo, has taken over the long inactive operation, C. D. Hagerty 1 Windham, 150 ft. out of NW cor. of SE Section 154, G.H.&H. Survey, and plans to deepen from its present total depth of 1,002 ft. to a depth of 1,250 ft. in search of pay zones from 1,000 to 1,250 ft. which have shown oil in nearby tests. Deepening contract has been awarded and equipment was being moved in at the close of the week.

New Wildcat Operations

McCulloch County and Palo Pinto County both reported new wildcat operations at the close of the week. In McCulloch County W. J. Willard staked 1 E. B. Garrett, 457 ft. from the north and east lines of G. F. Schneider Survey 934. It is a projected 2,250-ft. test.

In Palo Pinto County Hickok Production Co. and Reynolds have located 1 J. R. Halsell, 467 ft. from the south and west lines of Section 92, B.B.B.&C. Survey, Abstract 105. Contract depth is 5,500 ft.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

Semiwildcat: J. A. Campbell 1 Scott, Mail Scurlock Sur. 207, dry at 900 ft.

Coleman County

Echo field: Brannon & Murray 3-B Dibrell, 324 bbl., flowing through open tubing, 10-qt. shot 1,893-1,912 ft.

Novice field: States Oil 8 Morris, 173 bbl., ¾-in. choke, flowing 3,569-93 ft.

Goldsboro field: North-South Oil 8 Newton, 150 bbl., flowing through open tubing, 30-qt. shot 3,835-63 ft.

Eastland County

Dobbs field: Dobbs Oil 2 Thomason, 175 bbl., ⅛-in. choke, 280-qt. shot 2,580-2,655 ft., top Caddo lime 2,563 ft.

Jones County

Avoca field: Iron Mountain Oil and Groover & Rose 1 Peterson, 1,000 gal. acid 1,715-29 ft., dry at 1,729 ft.

Sayles field: F. K. Johnson and Ungren & Frazier 2 H. Sayles, Jr., 130 bbl., open tubing, 1,921-39 ft.

Wildcat discovery: Danciger Oil & Refineries, Inc., 1 Kelso, 330 ft. from S and 882 ft. from W lines of Lot 82, De Witt County School Lands Sur. 126, 139 bbl. in 16 hr., flowing through ⅝-in. choke 2,336-42 ft.

Nolan County

Wildcat: Tex-Harvey Oil 1 L. N. McRee, 488 ft. from S and W lines, NE Sec. 43. Blk. 19, T.&P. Sur., dry with no shows 5,210 ft.

Palo Pinto County

Gordon Gas field: W. K. Gordon 1 T.&P., dry at 3,534 ft., water.

Shackelford County

Wildcat: Choate 1-A Green, N½ SE Sec. 61, Blk. 12, T.&P. Sur., show oil 1,045-50 ft., dry at 1,265 ft.

WEST CENTRAL TEXAS WILDCAT REPORT

Brown County

A. J. Stokes 1 B. S. Bayston, 210 ft. from SE line and 2,962 ft. from SW line of Prosper Mangel Sur. 604, drilling 1,400 ft.

Callahan County

A. P. Heinze 1 J. Kincaid, 467 ft. from N and W lines of E½ SW Sec. 41, B.B.B.&C. Sur., 3,800-ft. test, location.

Rhodes Drilling Co. 1 N. M. George, NW Sec. 75, O.A.L. Sur., 4 mi. E Baird, 2,700-ft. test, S.D. 2,641 ft.

W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines of Sec. 2, C.&M. Sur., S.D., casing 815 ft.

C. D. Hagerty 1 Windham, 990 ft. from N and 330 ft. from W lines SE Sec. 154, G.H.&H. Sur., show oil 980-85 ft., S.D., but may deepen.

Reeves & Sorrell 1 Young, 1,980 ft. from N and 660 ft. from E lines Sec. 37, B.B.B.&C. Sur., H.F.W. 1,975-2,000 ft., running 6⅝-in. at 2,000 ft.

Coleman County

L. J. Derrick 1 J. W. Vance, 330 ft. NW of old Texas 1 Vance, also in Sec. 101, E.R. Sur., 2,100-ft. test, location.

R. H. Murray 1 Morris, 467 ft. S and W of NE 160 acres of J. Greenwood Sur. 304, drilling 1,300 ft.

M. R. Stuard 1 Minear, 330 ft. from N and 1,850 ft. from E lines of 360-acre tract in E. Votaw Sur. 244, location.

Comanche County

Campbell 1 Stark, SW part of Asa Hoxey Sur., S. D. repair 145 ft., will set 6⅝-in.

Natural Resources 1 Armor, Sec. 105, T.&N.O. Sur., 5 mi. NE of Eden, prepare to resume drilling at 1,565 ft., contract depth 3,250 ft., to Ellenburger lime, cleaned out to old T.D., prepare resume drilling, no report.

Concho County

Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur., 10 mi. SW Eden, show oil and gas 3,792-95 ft., 3,819-20 ft., at 3,828-29 ft., showed 1 bailer water per hr., may drill deeper.

Eastland County

C. D. Lane 1 Mason, 900 ft. from N and 750 ft. from W lines of W½ NE Sec. 13, D.&D.A. Sur., drilling 855 ft.

W. M. Morris 1 Carrie Bryant, 1,520 ft. from N and 200 ft. from W lines of SE Sec. 20, Blk. 1, H.&T.C. Sur., 6⅝-in. 825 ft.

Hickok Oil 1 Luse & Gray, NE Sec. 486, S.P. Sur., Ordovician test, ¼ mi. SE of new McElreath field, 4,250-ft. test, drilling 600 ft.

Erath County

W. A. Young 1 J. B. Mills, J. Harvey Sur., 5 mi. NW of Dublin, T.D. 212 ft., cleaning out hole.

Fisher County

F. A. Stephenson 1 Maberry, SE SW Sec. 56, Blk. 1, H.T.&B. Sur., 3,400-ft. test, cored 3,285-3,302 ft., recovered sand showing oil, set casing, drilled plug, flowing by heads 3,202 ft., S.D. 3,312 ft.

General Crude Oil 12 Flanigan, center of old Royston field, Ordovician test, drill pipe froze at 5,499 ft., T.D., S.D.O.

Hamilton County

A. J. Caldwell 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines, W. H. Crowder Sur., drilling past bit 2,999 ft.

C. J. Meyers 1 Oats, 420 ft. from S and 1,035 ft. from E lines, F. Hughes Sur., 4,000-ft. test, top Mississippian lime 3,827 ft., top Ellenburger 3,839 ft., flowing water into pits, no oil.

Falls Ref. Co. (formerly Wallace & Vickers) 2 Lund, C S½ of 20 acres of N½ of SW¼, R. J. Bailey Sur. 51, top Marble Falls 3,245 ft., show oil 3,260-65 ft., 6⅝-in. 3,256 ft., show oil 3,392-3,400 ft., live green oil 3,428-38 ft. and 3,458-62 ft., T.D. 3,615 ft. in water, P.B. to 3,290 ft., swabbing 2 bbl. oil and 6 bbl. water per day, drilling 3,724 ft.

Gunther & Smith 1 Thompson, 467 ft. from SE and 4,533 ft. from SW lines of Rhody Kennedy Sur., spudded and S.D.

Hensley & Watson 1 Manning, 467 ft. from W and 2,500 ft. from S lines of Agapo Gaithan Sur., rotary on location.

Bob Waters 1 Oates, 3,350 ft. from SE and 8,450 ft. from NE lines of F. Hughes Sur., S.D. 350 ft., may change operators.

Jones County

C. W. and W. L. Snoddy 1 Jackson, 3,400 ft. from S and 330 ft. from E lines of J. McGrew Sur. 245, 1,950-ft. test, drilling 2,105 ft.

Pearson 1 Carlson, SE W½ N½ Sec. 1, Blk. 5, H.&T.C. Sur., Palo Pinto test, S.D.O. 3,501 ft.

G. M. Gillespie 1 J. T. King, 990 ft. from N and 330 ft. from E lines of NW Sec. 53, O.A.L. Sur., S.D.O. 2,610 ft.

Humble 2 Sears, 467 ft. from S and W lines of Sec. 37, Blk. 18, T.&P. Sur., drilling 2,878 ft.

McCulloch County

W. J. Dillard 1 E. B. Garrett, 467 ft. from N and E lines of Sur. 934, Abst. 1196, 3,000-ft. test, location.

Menard County

Harry Baldwin 1 Leggett, SW SW Sec. 1, B.S.&F. Sur., S.D. casing 1,040 ft.

Palo Pinto County

Cole & Davis 1 Rogers, 467 ft. from S and E lines, Sec. 894, T.E.&L. Sur., T.D. 1,002 ft., running 8¼-in. casing.

Georgian Oil 1 Weldon, A. J. Smith Sur., Abst. 383, S.D.O. 1,425 ft.

E. Guyer 1 Dalton, L. B. Dalton Sur., Abst. 153, show gas 3,827-53 ft., show oil and gas 3,879-81 ft., bailing live oil, some water coming in behind 8¼-in. casing at 1,930 ft., T.D. 3,881 ft. (corrected).

Elgin & Watson 1 Watson, NE NW Sec. 10, Blk. 2, T.&P. Sur., fishing bit 4,065 ft.

Shackelford County

Roeser-Pendleton 1-A-118 Cook, SE SW Sec. 118, E.T. Sur., 2,000-ft. test, oil sand 1,697-1,700 ft., testing.

(Continued on Page 86)

MICHIGAN OPERATIONS

Gusher in Tallmadge Sector May Revive Walker Field

By OTTO C. PRESSPRICH

SAGINAW, Mich., Jan. 6. — A gusher in Tallmadge Township, Ottawa County, caused a flurry of excitement among southwestern Michigan oil operators as the new year began amid the uncertainty of a declining production picture and a strengthened price structure. Buyers of Michigan crude posted 10 cents a barrel price increases for the basin-area production and the oil potentialities of the Bay County deep test brought renewed interest in the possibility of crude and natural gas in commercial quantities at hitherto unexplored depths.

The Tallmadge gusher, Smith Petroleum Co. 4 Visser, in Section 34, came in with an estimated flow of 400 bbl. an hour, a showing that has not been matched in many months in the state and one that indicated it may rank among the biggest producers in the southwestern part of the state, despite the steady decline in the past 6 months in total production of the Kent-Ottawa field.

With a gas flow estimated at several million cubic feet, the Visser test filled a 200-bbl. tank in 20 minutes. Drillers reached 1,785 ft. and decided to drill 5 ft. deeper before shutting down for the night in quest of limestone top. Encountering a softening of the formation, the well suddenly blew itself in, shot the tools out of the hole, and oil streamed for 100 ft. above the 60-ft. derrick. Depth is about that of other wells in the area, but nearby completions have not been large producers. However, they found the Traverse formation tight, while the Visser test encountered a porous zone.

The Ottawa section accounted for three of the producers recorded in the past week as completions, two rating 50 bbl. a day, the other 15 bbl. Pure Oil Co. 36 and 37 Narmore in Midland's Porter field, producing, after acid, at the initial rates of 290 and 115 bbl. a day, respectively, were the only other producer completions of the week. A total of six completions were dry holes, four of them located in Van Buren County, another in Allegan County, the sixth in Allendale of Ottawa County.

The state Conservation Department issued nine drilling permits in the last week of 1940, making the total for the year 1,113, a decline of about 30 per cent as compared with 1939. Of the last nine, three went to Van Buren County, two to Allegan. Others are for tests in Clare, Montcalm, Lenawee, and Huron.

First figures of 1940 production in Michigan were those compiled by the Michigan Oil and Gas Association for the 12 fields in the Central Michigan area. The report said the 12 fields produced 280,369 bbl. of crude during the year from 950 wells, a decrease of 8 per cent compared with 1939. Value of the crude was placed at $294,387.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Porter	2	405	6,798
Ottawa County	3	115	5,453
Dry holes: Van Buren County	4	.....	4,875
Others	2	.....	3,586
Total	11	.....	20,712

MICHIGAN COMPLETIONS

Allegan County

Salem Township: H. C. Williams 1 Gordon, SE SW SW 10-4n-13w, dry, T.D. 1,614 ft.

Midland County

Porter Township: Pure Oil Co. 36 Narmore, SW NW NE 15-13n-1w, 290 bbl., acid, T.D. 3,400 ft.

Pure Oil Co. 37 Narmore, S½ SW SW 10-13n-1w, 115 bbl., acid, T.D. 3,398 ft.

Ottawa County

Allendale Township: Fisher-McCall Oil & Gas Co. 1 Easton, NW NE SW 18-7n-13w, dry, T.D. 1,972 ft.

Georgetown Township: Fisher-McCall 1 Moss, SW NW NE 2-6n-13w, 50 bbl., acid, T.D. 1,782 ft.

Tallmadge Township: J. Newell 1 Rapp, SE SE SW 23-7n-13w, 50 bbl., acid, T.D. 1,875 ft.

Swanson Consolidated Oil Co. 2 Lautenbach, SW SW SW 27-7n-13w, 15 bbl., acid, T.D. 1,796 ft.

Van Buren County

Bloomingdale Township: Clapsaddle & Harris 2 Remington, NW SE SW 10-1s-14w, dry, T.D. 1,310 ft.

F. S. Vahue 1 Phillips, NW NW SE 36-1s-14w, dry, T.D. 1,330 ft.

Columbia Township: W. E. Dotson 1 Lake, SW NW SE 12-1s-15w, dry, T.D. 1,216 ft.

Geneva Township: Twin Drilling Co. 1 Barringer, NW SE NE 2-1s-16w, dry, T.D. 1,019 ft.

War Needs Do Not Supersede Conservation Considerations

By VICTOR LAURISTON

CHATHAM, Ont., Jan. 4.—The aggregate crude allowable for 130 Turner Valley wells has been set by the Alberta Conservation Board at 682,000 bbl.

Robert E. Allen, chairman of the Conservation Board, states that the present 130 crude producers probably represent half the number that will be drilled eventually in the field. "New records for crude-oil development and production," he said, "were set by the Turner Valley field in 1940. New highs were registered in both monthly and yearly production. Before conservation, it was common for oil fields to reach a sharp peak of production about the time when half the field's wells had been completed. One important measure of the effectiveness of conservation is the extent to which peak production may be delayed or prolonged after the completion of half its wells.

"It is the hope of this board that Turner Valley will have no sharp peak of production followed by an abrupt descent into the valley of depletion. Rather than see this, it is the intention of the board to help Turner Valley producers build a broad and relatively smooth plateau of production, the width of which in years will be a direct indication of the practical developments of conservation in increasing ultimate recovery, and the smoothness of which will be a measure of seasonal stability of production as accomplished by a sound system of crude-oil storage." The board will continue to allocate production quotas based upon the optimum rate of production plus a tolerance consistent with current conditions.

North Turner Valley: Home Oil 1, LSD 8, 33-20-3w5, finished at 8,010 ft., 808 ft. in the Madison limestone, has run liner and is perforating to test the porous zones. In addition to the normal upper and lower zones, a third, close to the top of the Madison, was encountered.

West Central field: Arrow Royalties 2, LSD 15, 13-19-3w5, finished at 8,353 ft., has been given 400-bbl. allowable, increased from 325 bbl. provisional quota.

Royalite Oil 54, LSD 1, 7-19-2w5, has the Madison and is deepening after cementing 7-in. casing at 6,936 ft.

Southwest field: Commoil 4, LSD 9, 29-18-2w5, finished at 7,308 ft., 442 ft. in the Madison, and is acidizing and testing, with indications of a good producer.

Pacific Petroleums 4, LSD 3, 32-18-2w5, finished at 8,019 ft., showed open flow of 1,048 bbl. through 1-in. choke with gas-oil ratio of 2,000 ft. and bottom-hole pressure of 1,462 lb. Allowable has been set at 280 bbl.

Oklahoma Fields

(Continued from Page 59)

Garvin County

Tussy pool: Cox 4 Pate, NW SW SW 29-1-3w, pumped 40 bbl., casing stuck 1,673 ft., set 502 ft., ran 5-in. perf. liner, T.D. 2,615 ft.

Grady County

Knox pool: McCasland 1-A Ball, NW SE SE 21-3-5w, pumped 50 bbl., casing 2,306 ft., T.D. 2,383 ft.

Jackson County

Altus pool: Matthews 1 Blackburn, SE SE 4-1-20w, casing 1,385 ft., T.D. 1,645 ft., temporarily abandoned.
Doss 2 Robertson, SE NW SE 15-1-20w, flowed 300 bbl., casing 1,347 ft., T.D. 1,380 ft.

Kiowa County

Wildcat: Southwest 2 Fultz, NW SE SE 10-6-18w, casing 1,464 ft., T.D. 2,000 ft., dry.

Logan County

Crescent pool: Mid-Continent 2 Campbell, SE NE 33-17-4w, old well P.B. from 6,103 ft. to 4,924 ft., dry.
Lovell pool: Danciger 1 Rout, C NW NE 3-17-4w, upper Layton 4,750 ft., middle Layton 4,920 ft., lower Layton 5,075 ft., T.D. 5,195 ft., dry.

McClain County

Byars pool: Patsy 1 Bond, NW NE NE 16-5-3e, old well P.B. from 3,623 ft. to 2,635 ft., lift casing to 2,600 ft., flowed 62 bbl. oil, 15 bbl. water.

Okfuskee County

East Cromwell pool: Titus 2 Berryman, SW SW 25-11-8e, shot Cromwell 3,419-27 ft., T.D. 3,431 ft., flowed 600 bbl.
Sunray 1 Replogle, NE SW SE 35-11-8e, flowed 485 bbl., casing 3,475 ft., shot 3,484-90 ft., T.D. 3,492 ft.
Wildcat: Davon 1 Seran, C NE NW 3-11-9e, cellars and pits dug and abandoned.
Texas 1 Randall, NE NW NW 8-11-10e, 1,000,000 cu.

(Continued on Page 88)

Forest City Basin

(Continued from Page 56)

NEBRASKA COMPLETIONS

Richardson County

Falls City pool: Skelly 3 Wallraff, SE NW SE 20-1-16, pumped and flowed 618 bbl., acidized Hunton 2,241-49 ft., T.D. 2,252 ft.
Wildcat: Marion Travis 1 Stauffer, SW SW NE 22-1-13, dry, T.D. 3,141 ft., Topeka 465 ft., Lansing 760 ft., Mississippi 1,680 ft., Hunton 1,970 ft., Viola 2,770 ft., light saturation 1,992-95 ft.
Wildcat: Liberty Development 1 Fehr, C NW SE 31-2-16, dry, T.D. 2,595 ft., Lansing 910 ft., Mississippi 2,160 ft., Hunton 2,576 ft.

NEBRASKA DRILLING REPORT

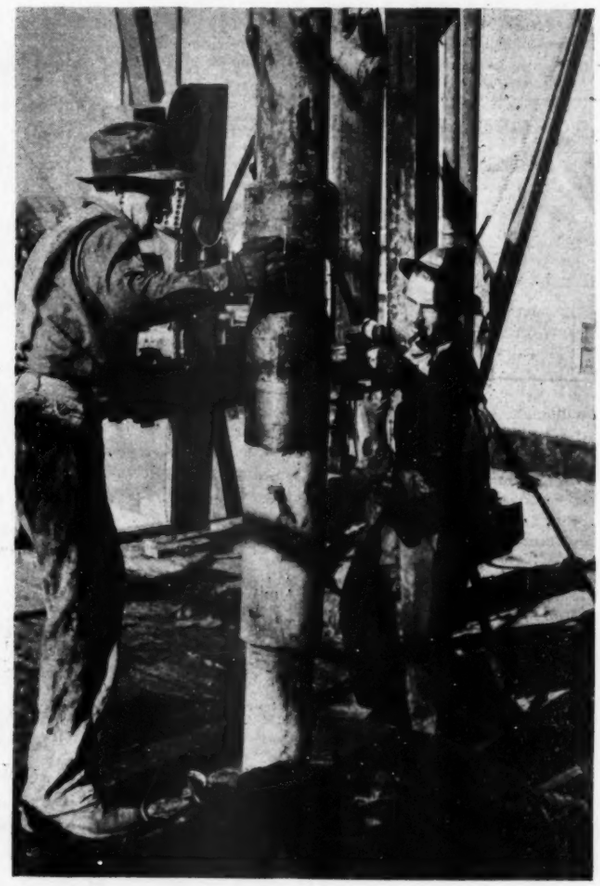
Nemaha County

Frank Engles 1 Wheeler . . . . . NE cor. 9-4-14
7-in. liner 2,540 ft., cleaning out 2,668 ft.
Francis Krone 1 Morehead . . . . . C SE NE 35-4-16
Drilling 3,493 ft.

Richardson County

Powers & Stalder 1 Lee . . . . . NE NW NE 16-1-14
Mississippi lime 2,074 ft., drilling 2,105 ft.
Pioneer Oil 1 Hough-Hill . . . . . C SE SW 6-1-16
Mississippi lime 2,127 ft., underreaming 2,195 ft.
W. H. Mangan 1 Smith . . . . . C E½ NW NW 31-3-16
Hunton 2,513 ft., light saturation 2,528-39 ft., 4-in. casing 2,515 ft.

TOOL PUSHER SOLVES PROBLEM OF WHIPPED-OFF SURFACE CASING —USES PATTERSON-BALLAGH PROTECTORS



One of the busiest contractors in Louisiana and Arkansas reports: "During a 2½-year period, with five rigs running, in which we completed 27 wells, we used Patterson-Ballagh Stabilizers and Protectors. During that time we did not have a single case of whipped-off surface casing. This was a common cause of trouble in other wells drilling in our immediate neighborhood where no Protectors were used in the surface pipe. Drilling was much smoother and faster with the Protectors. They saved us plenty of money and prevented plenty of trouble."

AVOID TROUBLE—USE
PATTERSON-BALLAGH PROTECTORS
PATTERSON-BALLAGH CORPORATION—Los Angeles—Houston—New York City

Deep Gas Tests Drilling Steadily Ahead

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Jan. 6.—Work was somewhat retarded in the lower eastern fields during the past week due to the usual holiday interruptions, yet 21 completions were reported, of which 3 were dry holes, 16 gas wells, and 2 oil producers with an initial daily of 33 bbl.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, none of the deep tests reached the Onondaga. Peoples Natural Gas Co. is fishing for a bailer at 6,682 ft. in 3 Piedmont Coal Co. and fishing tools at 548 ft. in No. 4, same lease. New Penn Development Co., William E. Snee et al are drilling at 4,236 ft. in 3 Summit Hotel. In North Union Township, Wasson et al are fishing the bailer at 6,764 ft. in 2 J. H. Sorg.

In Beaver County, L. D. McMichael et al set 10-in. casing at 405 ft. in the Oriskany wildcat on the Elmer Pflug farm in New Sewickley Township and resumed drilling.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Southwest Pennsylvania			
Gas wells	6	*1.1	14,532
West Virginia			
Oil wells	2	33	3,343
Gas wells	10	*1.9	19,650
Dry holes	3	.....	8,108
Total	15	.....	31,101

*Million cu. ft.

Armstrong County

Boggs Township: Humphrey, Stone & McCall 1 Lidge Best, 407,000 cu. ft. gas, Murraysville, R.P. 475 lb.
Kittanning Township: Equitable 1 Edward Boarts, 52,000 cu. ft. gas, Bradford sand, T.D. 3,747 ft.

Fayette County

Menallen Township: Eberly, Snee et al 1 Bachman, 400,000 cu. ft. gas, Big Injun sand, gas 1,298-1,300 ft., R.P. 460 lb., T.D. 1,360 ft.
Nicholson Township: Greensboro 1 George Lecrone, 74,000 cu. ft. gas, Fifth sand 2,372-2,440 ft., gas 2,373-80 ft., T.D. 2,613 ft.

Greene County

Wayne Township: Freeland et al 1 J. H. Simpson, 20,000 cu. ft. gas, Fifth sand 3,220 ft., gas 3,133-36 ft., T.D. 3,430 ft.

Washington County

Fallowfield Township: Equitable 1 D. Irwin, 174,000 cu. ft. gas, Gantz sand, T.D. 2,265 ft.

WEST VIRGINIA

In Poca district, Kanawha County, the deep test of Columbian Carbon Co. drilling on the John Price farm has reached 6,678 ft. or 48 ft. below the top of the Clinton sand. On the Copenhaver heirs farm this company is down 5,700 ft.

In Harrison County, the deep rotary wildcat of Hope Natural Gas Co. on the C. S. Gribble farm in Grant district is shut down for a bearing replacement after reaching 9,755 ft.

In Ravenswood district, Jackson County, Columbian Carbon Co.'s two wildcats are drilling at 3,798 ft. F. F. Starcher and 3,011 ft. F. L. Roliff. The Boggess Drilling Co. is spudding in 1 Mary Smith. In Ripley district, the United Carbon Co. wildcat on the B. B. Meadows farm is cementing at 4,460 ft.

Boone County

Scott district: Hope 8506 Fred B. Chambers, 300,000 cu. ft. gas, Big lime 1,740-1,950 ft., Injun 1,930-55 ft., Berea 2,414 ft., gas in Berea, T.D. 2,447 ft.

Braxton County

Birch district: Pittsburgh & W. Va. 7773 Bessie Mollahan, 5,950 cu. ft. gas, through Injun, T.D. 2,073 ft.

Cabell County

Guyandotte district: George S. Starr 1 R. E. Starkey, 25 bbl., Big lime, T.D. 1,205 ft.

Calhoun County

Sherman district: Hope 8503 C. W. Harris, 90,000 cu. ft. gas, Big lime 1,924-2,010 ft., Injun 2,010-98 ft., gas 2,048-52 ft., T.D. 2,136 ft.
McCall Drilling Co. 1 Daisy Wilson, 73,000 cu. ft. gas, Big lime 1,898-1,980 ft., Injun 1,980-2,050 ft., gas 2,010-50 ft., T.D. 2,125 ft.
M. V. Knight 1 J. B. Ward, 8 bbl., Injun sand, T.D. 2,138 ft.

Clay County

Henry district: Joe Rubin 3 Adena Corp., 377,000 cu. ft. gas, Injun sand 1,776-1,820 ft., T.D. 1,820 ft.
Otter district: Pittsburgh & W. Va. 7673 W. E. Butler, dry, through Injun sand, T.D. 2,254 ft.

Gilmer County

DeKalb district: Carnegie 1 Boyd C. Collins, dry, Big lime 1,969-2,024 ft., Injun 2,024-2,124 ft., show gas 2,073 ft., T.D. 2,178 ft.

Kanawha County

Washington district: Owens, Libby-Owens 1 Mary E. Ballard, dry, through shale, T.D. 4,676 ft.

Nicholas County

Jefferson district: Elk River Gas Co. 1 Samuel Stephenson, 450,000 cu. ft. gas, top Injun sand 2,163 ft., T.D. 2,170 ft.

Putnam County

Scott district: Smith & Ellison 1 R. G. & Martha Simms heirs, 116,000 cu. ft. gas, Berea, T.D. 2,200 ft.

Ritchie County

Grant district: South Side Oil & Gas Co. 1 Anna Carroll et al (Myrtle Powell et al), 20,000 cu. ft. gas, Injun sand, T.D. 1,850 ft.
Union district: W. H. Mossor 1 N. D. & Abel Wright, 500,000 cu. ft. gas, Big Injun sand, T.D. 1,954 ft.

Wetzel County

Grant district: Hope 2 John W. Lowe, 8,800 cu. ft. gas, Pittsburgh Coal 837-43 ft., shot through coal, T.D. 845 ft.

ORISKANY GAS FIELDS

No wells were completed in the Oriskany gas fields in either Kanawha or Jackson counties.

DRILLING

Kanawha County

Poca district: United Fuel 4880 Allie Pritt, top Corniferous 4,904 ft., 7-in. casing to 4,919 ft.
United Fuel 4893 K. E. Legg, 3,712 ft.
Godfrey L. Cabot 14 Putnam Co., 4,405 ft.
Godfrey L. Cabot 5 J. L. McLean, 4,469 ft., fishing tools.
Poca Fork O. & G. Co. 1 Siegle Moore, 4,250 ft.

North Texas Fields

(Continued from Page 84)

Georgian Oil Corp. 2 Blach, 1,290 ft. from SE and 540 ft. from SW lines, Sec. 301, T.E.&L. Sur., deep test, spudded and S.D.
Choate 1 Green, 150 ft. from N and W lines of N½ SE Sec. 61, Blk. 12, T.&P. Sur., drilling 987 ft.
R. T. Nall 1 Cook, 150 ft. from N and W lines of SE SW Sec. 53, E.T. Sur., S.D.O. 300 ft.

Runnels County

A. J. Johnson 1 Bert Fletcher, E. W. Bull Sur. 333, 5,500-ft. test, S.D. 515 ft.

Taylor County

Ce-Beth Oil 1 City of Abilene, south shore of Lake Abilene on city property, 4,000-ft. test, running 10-in. casing 2,300 ft.

Illinois Fields

(Continued from Page 76)

Pumped 300 bbl. oil and 10 bbl. water, 5,000 gal. acid, McClosky 3,040-44 ft., 3,055-58 ft., 3,081-83 ft.
Boyleston pool: Myers 2-B Cormick . NW NE SW 4-2s-7e
Flowed 168 bbl., McClosky 3,258-67 ft., 3,278-82 ft., T.D. 3,284 ft.
O'Meara 3 McLin . . . . . NW SE NE 9-2s-7e
Flowed 149 bbl. in 14 hr., 3,000 gal. acid, McClosky 3,242-46 ft., T.D. 3,273 ft.
Texas 2 D. K. Davies . . . . . E½ NW NW 10-2s-7e
Pumped 70 bbl., 3,000 gal. acid, McClosky 3,241-44 ft., 3,278-82 ft., T.D. 3,288 ft.
Dunbar 1 T. T. Finley . . . . . SE SW NW 4-2s-7e
Dry, Menard 2,460 ft., Glen Dean 2,670 ft., Barlow 2,853 ft., Renault 3,151 ft., Aux Vases 3,160 ft., Ste. Genevieve 3,214 ft., T.D. 3,313 ft.
Wildcat: Pure 1 G. Flexten . . . E½ SE SE 35-1n-7e
Pumped 217 bbl., Aux Vases 2,922-28 ft.
Pure 1 J. Elliott . . . . . W½ NE SW 1-1n-7e
Pumped 34 bbl. oil and 3 bbl. water, 3,000 gal. acid, 2,994-97 ft., 3,010-13 ft., T.D. 3,034 ft.

Wabash County

Maud pool: Bell 2 Keeps . . . . . NE NW NE 34-1s-13w
Dry, Clore 1,680 ft., Menard 1,812 ft., Vienna 1,952 ft., Glen Dean 2,085 ft., Barlow 2,268 ft., Benoist 2,425-47 ft., Aux Vases 2,563-69 ft., Ste. Genevieve 2,584 ft., T.D. 2,690 ft.
North Griffin pool: J. J. Broadus 1 A. E. Epler . . . . . NE NE NE 31-2s-13w
Pumped 18 bbl., 20-qt. shot, Cypress 2,481-94 ft., T.D. 2,496 ft.
J. J. Broadus 2 Epler . . . . . SE SE SE 31-2s-13w
Pumped 40 bbl., Cypress 2,480-98 ft.
S. Yingling 3 Compton . . . . . NW SE SW 19-2s-13w
Dry, 20-qt. shot, Biehl 1,702-14 ft., T.D. 1,716 ft.

White County

East Calvin pool: Herndon 1 Hahn NE SW SE 32-3s-14w
Pumped 70 bbl., 140-qt. shot, Benoist 2,742-72 ft., T.D. 2,774 ft.
Arrow 3 Hahn D . . . . . SE SW SW 33-3s-14w
Pumped 150 bbl. oil and 100 bbl. water, McClosky 2,898-2,902 ft., 3,000 gal. acid, T.D. 2,910 ft.
Duncan 4 A. Hughes . . . . . NW SE SE 17-4s-14w
Pumped 144 bbl., Cypress 2,561-70 ft., T.D. 2,586 ft.
W. W. Gray 2 fee . . . . . SW SW NE 17-4s-14w
Pumped 133 bbl., 40-qt. shot, Benoist 2,688-2,709 ft.
W. W. Gray 3 fee . . . . . SE SE NW 17-4s-14w
Pumped 75 bbl., 20-qt. shot, Benoist 2,696-2,702 ft.
W. W. Gray 4 fee . . . . . NE SW NE 17-4s-14w
Pumped 133 bbl., 20-qt. shot, Benoist 2,688-2,719 ft.
Bryan 9 Bramlett A . . . . . N½ SW SE 17-4s-14w
Flowed 175 bbl., 40-qt. shot, Paint Creek 2,672-85 ft., Benoist 2,696-2,720 ft.
Bryan 4 Bramlett B . . . . . NE NW SE 17-4s-14w
Flowed 90 bbl., Cypress 2,554-84 ft.
Skelly 1 Daly, trustee . . . . . NE NE SW 17-4s-14w
Pumped 46 bbl. oil and 35 bbl. water, Benoist 2,702-33 ft., P.B. 2,731 ft., P.B. 2,725 ft.
K. B. Yost 3 Bramlett . . . . . SE NW SE 17-4s-14w
Pumped 80 bbl., Cypress 2,566-97 ft.
Herndon 1 Garrison heirs . . . . . SW NW NE 8-4s-14w
Flowed 40 bbl., 70-qt. shot, Benoist 2,722-39 ft., Aux Vases 2,800 ft., T.D. 2,810 ft.
Magnolia 8 J. J. Bond . . . . . NE NE SW 8-4s-14w
Pumped 37 bbl. oil and 24 bbl. water, 60-qt. shot, Benoist 2,719-35 ft.
Pure 7 Potter . . . . . SW NW NW 9-4s-14w
Pumped 90 bbl., McClosky 2,903-10 ft., 30-qt. shot, Aux Vases 2,816-24 ft., T.D. 3,145 ft., P.B. 2,910 ft.
Pure 8 Potter . . . . . NW NW NW 9-4s-14w
Pumped 108 bbl., McClosky 2,805-32 ft., 2,930-41 ft., 20-qt. shot 2,681-95 ft., T.D. 2,960 ft., P.B. 2,856 ft.
Bell Bros. 1 Shiles . . . . . NW NW SW 16-4s-14w
Pumped 140 bbl., 40-qt. shot, Benoist 2,707-25 ft., ft., T.D. 2,727 ft., P.B. 2,725 ft.
Pure 4 G. P. Calvin B . . . . . SW SW NW 16-4s-14w
Flowed 1,001 bbl., 88-qt. shot, Aux Vases 2,826-58 ft.
Cherry & Kidd 6 W. W. Gray B . . . . . SE NE NE 17-4s-14w
Pumped 85 bbl. in 10 hr., 6 per cent water, 120-qt. shot, Benoist 2,665-2,724 ft., P.B. 2,711 ft.
Duncan 2 C. C. Hughes . . . . . SW NE SE 17-4s-14w
Pumped 130 bbl., 30-qt. shot, Aux Vases 2,709-21 ft.
Duncan 2-A Hughes . . . . . SW NE SE 17-4s-14w
Pumped 133 bbl., Cypress 2,558-82 ft.
North New Harmony pool: Superior 8 E. M. Fitton . . . . . SW SW SW 23-4s-14w
Pumped 100 bbl., Tar Springs 2,190-98 ft., Cypress 2,647-64 ft., McClosky 2,905-7 ft., 2,928-31 ft., 5,000 gal. acid in McClosky.
Superior 7 H. C. Ford C . . . . . NW SE SE 27-4s-14w
Pumped 75 bbl., 3,000 gal. acid, McClosky 2,880-85 ft., T.D. 2,955 ft., P.B. 2,895 ft., lower McClosky 2,946-55 ft.
Superior 2 S. R. Stanley . . . . . SE SE NW 27-4s-14w
Pumped 91 bbl., 3,000 gal. acid, McClosky 2,890-94 ft., T.D. 2,925 ft.
Sun 20 E. R. Greathouse . . . . . NE SE SE 33-4s-14w
Pumped 146 bbl., 60-qt. shot, Cypress 2,568-88 ft., Benoist 2,684-2,726 ft.
Tide Water 8 Dennis . . . . . NW SW NE 33-4s-14w
Pumped 203 bbl., 20-qt. shot, Benoist 2,667 ft., pay 2,723-33 ft.
Tide Water 10 Dennis . . . . . SE NE NE 33-4s-14w
Pumped 335 bbl., 30-qt. shot, Benoist 2,692-2,720 ft., T.D. 2,726 ft.
Tide Water 12 Dennis . . . . . NE NE NE 33-4s-14w
Flowed 170 bbl., 2,500 gal. acid, McClosky 2,881-84 ft., T.D. 2,911 ft., P.B. 2,910 ft.
Superior 1 H. C. Ford F . . . . . NW NW NE 34-4s-14w
Flowed 1,159 bbl., 2 per cent water, 5,000 gal. acid, McClosky 2,949-52 ft., 3,000 gal. acid, McClosky 2,873-89 ft., T.D. 2,952 ft.
Superior 6 H. E. Given . . . . . NW SW SW 34-4s-14w
Pumped 180 bbl., 4 per cent water, 3,000 gal. acid, McClosky 2,892-96 ft., perf. 2,580-90 ft. Cypress, 2,691-97 ft. Benoist, 2,725-75 ft., Benoist, T.D. 2,919 ft.
Superior 3 H. C. Ford . . . . . SW NE SE 22-4s-14w
Flowed 850 bbl., 5,000 gal. acid, McClosky 2,902-08 ft., 2,931-34 ft., T.D. 3,927 ft.
Mill Shoals pool: Nation & Poorman 2 P. E. Painter . . . . . NW NE SE 19-3s-8e
Pumped 170 bbl., 30-qt. shot, Aux Vases 3,234-66 ft.
New Penn Dev. 2 McKeyes . . . . . NW NE SE 19-3s-8e
Pumped 197 bbl., 45-qt. shot, Aux Vases 3,214-54 gt., T.D. 3,263 ft.
H. G. Spiller et al 1 Gray . . . . . SE SW NE 19-3s-8e
Pumped 150 bbl., 30-qt. shot, Aux Vases 3,226-60 ft.
W. W. Gray 1 fee . . . . . S½ NW NE 31-3s-8e
Pumped 135 bbl., Aux Vases 3,212-64 ft., McClosky 3,352-81 ft., T.D. 3,383 ft., P.B. 3,273 ft.
S. J. Cromwell et al W. A. Felix B . . . . . W½ SE NE 19-3s-8e
Dry, Ste. Genevieve 3,308 ft., Fredonia 3,354 ft., T.D. 3,372 ft.
Springerton pool: Ben Nation 4 Ross Dunn . . . . . NW NW NW 6-4s-8e
Pumped 152 bbl., 25-qt. shot, Aux Vases 3,227-49 ft.
West Irons pool: Max Pray 1 W. D. Weiranck . . . . . SE SW SW 23-6s-8e
Dry, 3,000 gal. acid, McClosky 3,089-3,185 ft.
Storms pool: Exchange 2 Holderby SW NE NE 11-6s-9e
Pumped 38 bbl. oil and 60 bbl. water, 5-qt. shot, Waltersburg 2,280-86 ft., T.D. 2,292 ft., P.B. 2,281 ft.
Bowers 3 Storms . . . . . E½ SE NE 22-6s-9e
Flowed 100 bbl. oil and 5 bbl. water, 40-qt. shot, Waltersburg 2,240-60 ft. (gas 2,207-38 ft.), Ste. Genevieve 2,911 ft., T.D. 3,046 ft., P.B. 2,260 ft.
Wildcat: Yingling 1 Ford heirs . SE NE SW 22-4s-14w
Pumped 45 bbl. oil and 2 bbl. water, Cypress sand 2,600-18 ft., T.D. 2,625 ft.
French & Cotton 1 May Roy . . . S½ NW NW 30-3s-9e
Dry, Glen Dean 2,840 ft., Golconda 2,970 ft., Cypress 3,087 ft., Paint Creek 3,262 ft., Benoist 3,356 ft., Aux Vases 3,390 ft., Ste. Genevieve 3,446 ft., Fredonia 3,500 ft., T.D. 3,602 ft.

Johnson County, Ky., Leasing Campaign Gets First Show

By STAFF CORRESPONDENT

ASHLAND, Ky., Jan. 6.—Completion of a "wildcat" gas well, possibly heralding a new gas field, and the report of a well producing 60 bbl. of oil per day hold the spotlight in eastern Kentucky this week. Another gas well was reported completed and two dry holes are listed in the activities from the various areas.

The Virginian Gasoline & Oil Co. reports the completion of No. 4 on the W. H. Blankenship tract on Rockcastle Fork at a total depth of 1,168 ft. The field report said the well started to flow at the rate of 60 bbl. of oil daily after being shot.

Attention has been sharply directed to Johnson County with the completion of a well by S. C. Allen on the Albert Horn land at a total depth of 2,319 ft. Before tubing was run and the well closed in, it was making better than 300,000 cu. ft. of gas at the bottom of Corniferous.

There has been a general leasing campaign in Johnson County for the last few weeks but the drilling in of this wildcat has brought a decided spurt in leasing activities. Most of the leases in the immediate vicinity of the well, 4 miles west of Paintsville, have been taken up, and the present leasing is directed at tracts further away.

There has been no commercial production of gas in this immediate area before and bringing in this well is certain to be followed by drilling of others, according to authoritative sources here. The ease of developing a new gas field in this area is stressed by the fact that the Allen well is within 1½ miles of one major firm's pipe line and within 2½ miles of a second large pipe line.

Another operation of interest in eastern Kentucky is located on the W. S. Qualls farm, 2 miles southwest of Olive Hill in Carter County. This well is also a wildcat and is now down to the 800-ft. mark with drilling continuing. The operator's name was not given in a report received but a reliable source said there was a showing of gas at the 400-ft. level. This source termed the gas "enough to use for a fire." There have been a few very small gas wells drilled in Carter County but these were of small commercial value. This operation is certain to hold attention of operators in this area.

Oliver Jenkins et al hit a dry hole after going to Big lime in No. 2 on the Rolla Dixon land on Pasture Branch in Morgan County. They have moved to the Anthony Ison tract at the mouth of Pasture Branch and will start a Corniferous test.

Ashcraft & Duncan report a dry hole in No. 7 on the J. A. Curry land on Little Sinking in the Big Sinking district of Lee County.

The Kentucky-West Virginia Gas Co. has completed No. 5282 on the Benjamin Smith land on Four Mile Branch of Jones Fork in Knott County, with the well reaching a total depth of 2,685 ft. in shale. It is producing 189,000 cu. ft. of gas, 13 hour, with rock pressure of 240 lb.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Ohio			
Oil wells	3	50	4,483
Gas wells	11	*5.5	19,350
Dry holes	6	.....	12,463
Total	20	.....	36,296
Eastern Kentucky			
Oil wells	1	60	1,168
Gas wells	2	*0.5	4,005
Dry holes	2	.....	(†)
Western Kentucky			
Oil wells	1	50	1,268
Dry holes	2	.....	2,922
Total	3	.....	4,190

*Million cu. ft. †Not reported.

WESTERN KENTUCKY COMPLETIONS

Butler County

Dunbar district: Jack Cox et al 1 R. E. Taylor, dry, T.D. 1,160 ft.

Daviess County

Handyville district: Ohio 9 Steven Coombs, 50 bbl., 70-qt. shot, Jett sand 1,247-66 ft., T.D. 1,268 ft.

McLean County

Glenville district: Stewart & Snyder 2 A. Hansford, dry through McClosky, T.D. 1,762½ ft.

OHIO FIELDS

NEWARK, Ohio, Jan. 6.—The old Wooster oil field which has produced from the Clinton horizon since its opening in 1911 is to be given a Trenton test. The Ohio Oil Co., one of the major operators in the field, has staked a location 1½ miles southeast of Wooster on the Joseph H. Armstrong tract in NW SW Section 11, Wooster Township, Wayne County.

The sub-Trenton test by McCloy, Inc., in Jersey Township, Licking County, is still occupied with a fishing job at 4,330 ft.

In Belmont County, Ohio, the Natural Gas Co. of West Virginia passed through the Newburg horizon in the deep test on the E. A. Mobley farm, Section 19, Smith Township. Some water was found at about 7,000 ft. which presumably was from the Newburg. Casing has now been run to just past 7,300 ft. and drilling will continue. In Columbiana County this company is 123 ft. in the Onondaga or at a depth of 4,300 ft. in the Oriskany test on the William Tice farm, Section 19, Wayne Township.

Only 20 wells were completed in the Ohio fields, 11 gas, 6 dry, and 3 oil wells.

Ashland County

Mohican Township: Ohio Fuel 1 Elza Hootman, Sec. 22, 768,000 cu. ft. gas, Clinton, T.D. 2,874 ft.

Athens County

Carthage Township: Mathews Oil Co. 1 D. A. Parker, Sec. 30, dry, Salt sand, T.D. 1,040 ft.

Coshocton County

Tiverton Township: Ohio Fuel 1 George Branstool, Sec. 8, 330,000 cu. ft. gas, Clinton, T.D. 3,364 ft.
Pike Township: Dunn Mar Oil & Gas Co. 2 Gilbert Ashcraft, NE Sec. 19, 43 bbl., Clinton sand, T.D. 3,107 ft.

Cuyahoga County

Independence Township: Snyder et al 3 Mary Buhl, Lot 15, Tract 2, 3,600,000 cu. ft. gas, Newburg 2,706-17 ft.

Guernsey County

Center Township: Ralph McConnell 1 fee, Lot 9, 50,000 cu. ft. gas, Berea, T.D. 1,270 ft.

Knox County

Jefferson Township: H. E. Perkins 1 Edwin S. Beatty, Sec. 9, dry, Clinton, T.D. 2,836 ft.

Lawrence County

Windsor Township: Dave Fox 1 Jacob Schneider, Sec. 31, 100,000 cu. ft. gas, shot, Ohio shales, T.D. 2,557 ft.

Lorain County

Grafton Township: Forest Oil 1 B. A. Rothgery, Lot 48, shot, Berea, T.D. 171 ft.
Williams Dev. Co. 1 Alex Hartwig, Lot 46, dry Berea, T.D. 196 ft.

Medina County

Chatham Township: Eaken Brothers 1 fee, Tract 21, 100,000 cu. ft. gas, Berea, T.D. 514 ft.

Meigs County

Bedford Township: Ohio Fuel 1 Wm. C. Story, Sec. 18, 60,000 cu. ft. gas, shot, second Berea, T.D. 1,602 ft.
Rutland Township: Shuster et al 1 Arthur Nelson, Sec. 22, 260,000 cu. ft. gas, T.D. 545 ft.

Perry County

Monroe Township: C. Z. Ruth 24 N. L. and C. M. Ridgers, NW Sec. 27, 5 bbl., Berea, T.D. 1,205 ft.

Richland County

Mifflin Township: T. E. George 2 J. F. Keefer, Sec. 28, dry, no Clinton sand, T.D. 2,608 ft.

Wayne County

Chester Township: Ohio Fuel 1 Benj. Norton, Sec. 30, dry, Clinton, T.D. 3,200 ft.

Washington County

Barlow Township: Schramm Bros. 12 W. A. Christopher, Sec. 1, dry, Maxon, T.D. 1,436 ft.
Liberty Township: Otto Heidman 2 Alban heirs, Sec. 21, 75,000 cu. ft. gas, Germantown sand, T.D. 1,168 ft.
DePuy Bros. 7 H. W. Winland, Sec. 4, 30,000 cu. ft. gas, stray and Injun, T.D. 1,558 ft.
Best Run Oil Co. 1 D. Myers heirs, Sec. 27, dry, stray, T.D. 1,147 ft.
Newport Township: Schneider Oil Co. 1 M. H. Noland, Sec. 22, 70,000 cu. ft. gas, second Cow Run, T.D 1,281 ft.

Louisiana Gulf Coast

(Continued from Page 75)

bottom preparatory to testing a series of sands logged by an electrical survey. Several possible sands were logged at intervals in the normal pay horizon from approximately 7,100-8,300 ft., while several sand sections are reported to have been logged near the total depth. The well is located 5-20s-19e, and is the deepest test ever drilled on the structure.

Location for another interesting wildcat was announced by the Texas Co. The well is 1 State-Marsh Island located approximately 3 miles offshore from Iberia Parish in the Gulf of Mexico. This is the third marine wildcat operation to be announced by the company within the past 2 weeks, and the location is the first to be drilled in the Gulf of Mexico in the extreme southeast part of the district. The only well drilled in the Gulf was by Superior Oil Co. offshore from Cameron Parish which resulted in the discovery of the Creole field.

LOUISIANA GULF COAST COMPLETIONS

Acadia Parish

North Crowley field: Humble 9 Williams, 494 bbl., ¼-in. choke, T.D. 8,606 ft.
Jennings field: Imperial Oil Co. 6 Clement, 70 bbl. oil and 10 bbl. salt water, pumping, sand 1,900-23 ft.

Calcasieu Parish

Edgerly field: Emerson Oil Co. 16 Hunter, 196 bbl., ¼-in. choke, T.D. 3,631 ft.

Evangeline Parish

Ville Platte field: Continental 2 Deville, 72 bbl., 3/32-in. choke, perf. casing 9,010-27 ft., T.D. 9,029 ft.
Danciger 4 Vidrence, 620 bbl., ¼-in. choke, perf. casing 10,044-72 ft., T.D. 10,145 ft.

St. Martin Parish

Anse La Butte field: William Helis 1 DeBorah, dry, T.D. 1,747 ft.

LOUISIANA GULF COAST DRILLING REPORT

Acadia Parish

Humble 3 Leger, South Crowley field, 22-10s-1e, drilling shale 5,356 ft.

Ascension Parish

Williams & King 1 United Lands, flank test Sorrento dome, 26-10s-43, drilling shale 6,015 ft.

Assumption Parish

Shell 1 State-Grassy Lake, 11-15s-13e, drilling shale 9,525 ft.

Cameron Parish

Superior 17 State, Grand Lake field, 11-13s-4w, drilling shale 9,467 ft.

St. James Parish

Shell 1 Schexnayder Community, La Pice field, 38-21s-15e, drilling shale 7,840 ft.

St. Martin Parish

Shell 3 Iberville Land Co., Happytown field, 87-7s-8e, drilling shale 3,437 ft.

Terrebonne Parish

Bering Oil Co. 1 Willie A. Land, 9-16s-16e, S.D. 220 ft.

Vermilion Parish

Union Oil Co. of Calif. 4 Louisiana Land & Fur Co., 1½ mi. NE discovery well, Schooner Bayou field, drilling 7,600 ft.
Continental 1 C. P. Motty, Abbeville field, 18-12s-3e, drilling shale 6,810 ft.
Fohs 2 Mulvey Irrigation Co., south flank Gueydan field, 34-11s-1w, drilling shale 9,839 ft.

Southwest Texas Fields

(Continued from Page 64)

St. Charles field, drilling shale 10,394 ft.
Humble 1 St. Charles Bay, tract No. 27, drilling sand 7,840 ft.

De Witt County

Atlantic 1 Zengerle, NE of discovery well, Thomaston field, drilling shale 6,578 ft.

Kleberg County

Skelly 1-388 State, SW of discovery well Baffin Bay field, drilling shale 5,125 ft.

Lee County

Humble 1 Melde, L. P. Rucker Sur., drilling shale 5,548 ft.

Nueces County

H. J. Mosser 1 Eggleston, Richard King subd., Sec. 25, coring sand 5,284 ft.
H. H. Howell 1 Mattiza, W. B. Baker subd., Block 2, dry, T.D. 6,512 ft.
H. H. Howell 1 Hellman, E. R. Oliver Sur., dry, T.D. 7,608 ft.

Willacy County

Pan American 1-B Willamar Community, SE of discovery well, Willamar field, drilling sandy shale 5,630 ft.
Pan American 1 G. C. Keng, Willamar field, spudded.

Wilcox Sand Shows Distillate In Colorado County Test

By NEIL WILLIAMS

HOUSTON, Tex., Jan. 6.—The apparent discovery of distillate production from the Wilcox sand in Colorado County, and the attempted blowout of a wildcat southwest of the Alta Loma field, Brazoria County, were the highlights of development along the Texas coast the past week.

W. R. Davis Co., Inc., 1 Brownston was apparently opening distillate production from the Wilcox sand in the Garwood area, Colorado County, as it was cleaning out at the close of the week flowing at the estimated rate of 4 bbl. of wash water with a trace of distillate per hour through a ⅛-in. choke under a tubing pressure of 1,750 lb. This well was drilled to a total depth of 10,012 ft., and 6-in. casing was cemented at 9,906 ft., preparatory to testing several showings logged by an electrical survey. The present showing is from perforated casing at 9,423-35 ft., and the wash water is said to have an occasionally brackish taste which may eventually result in the well being killed and retested in another sand section. Location is in the E. S. Wooley Survey, about 2 miles southwest of the company's 1-A McLane, a 10,000-ft. dry hole which is credited with having logged several sand sections in the Wilcox zone. The top of the Wilcox was not available.

Strake Petroleum Co., Inc., 1 Griffith, a wildcat about 2½ miles southwest of the Alta Loma field in Brazoria County, was being watched with much interest as the well attempted to blowout while drilling at 8,144 ft. The well is shutdown at this depth and the company is conditioning mud before coring ahead. Geological markers and the top of the sand section were not available as little information is being released. Location is in the H. P. Cayce Survey.

Humble 3 Hubbard, on the northwest side of the Rowan field, Brazoria County, recovered 30 ft. of gas-cut mud on a 20-minute drill-stem test at 8,944-51 ft. and, after coring sand and shale with a gas odor at 8,951-9,115 ft., the company shut down to run an electrical log. The discovery pay was cored 8,553-90 ft. and the well was drilled deeper to test the 8,900-9,000-ft. sand which has showed gas and distillate in several wells.

SUMMARY OF COMPLETIONS

Texas Gulf Coast

	No.	Bbl.	Footage
Oil wells: Lolita	3	1,198	18,256
West Ranch	2	916	10,885
Withers	2	226	10,918
Other fields	7	1,398	45,728
Dry holes: Fields	1	.....	8,018
Wildcats	2	.....	14,308
Total	17	.....	108,113

Mauritz Area, Jackson County

Northeast of La Ward in the Mauritz area, Jackson County, Humble 1 Egg, a prospective pool opener, is drilling in shale and sand below 8,037 ft. As more details of the core record of this well are released it becomes more apparent that the well stands a good chance of producing. With the Frio topped at 5,178 ft., and sand and shale with showings of oil and gas logged at intervals from 5,259-92 ft., additional information on the core record show that shale and sand with oil and gas were cored at intervals from 5,270-95 ft., and from 6,010-6,100 ft.

Galveston Bay

One mile south of the discovery well of the Red Fish Reef field, offshore from Chambers County in Galveston Bay, Humble is preparing to retest 7-A-264 State after the well flowed 1 bbl. of fluid, 40 per cent of which was oil and the balance salt water from perforated casing at 9,127-32 ft. Two of the company's other operations have reached critical stages. No. 8-A-223 State is drilling in sandy shale at 9,490 ft., while 9-A-263 State, 1 mile southwest of the discovery well, is drilling in shale below 9,785 ft. The latter test logged sand with an oil odor at intervals from 8,633-9,345 ft.

To the north, and located approximately 3,000 ft. northwest of the discovery well of the Red Fish Reef field, Standard Oil Co. of Texas defined the structure when the hole was abandoned at a total depth of 9,004 ft. The Round Marginulina was topped at 7,212 ft., and the Flat Marginulina at 7,242 ft.

Reports of an oil and gas showing in the Wilcox formation has attracted considerable attention to the Magnolia area, Montgomery County, where the progress of Superior Oil Co. of California 1 T. A. McWhorter is held up due to a fishing job. The hole is bottomed at 8,567 ft., and a small amount of sand with an oil and gas odor was recovered in cores at intervals from 8,464-78 ft., 8,494-97 ft., 8,511-19 ft., 8,535-44 ft., and 8,544-53 ft. The well is located in the T. J. Nichols Survey, about 6 miles east of Magnolia. Contract depth is approximately 10,000 ft.

Sun Oil Co. staked location for its first test in the South China field, Jefferson County, as material was being moved in for 1 Broussard Trust on the southwest side of the field in Lot 3. The field was defined to the northeast as Pan American abandoned 5 Fontenot in a sidetracked hole at 7,950 ft. Sand with an oil odor was topped at 7,944 ft., but drill-stem testing recovered salt water.

Chocolate Bayou Extension

Phillips 1 Houston Farms Development Co., approximately 1 mile west of the discovery well of the Chocolate Bayou field, Brazoria County, is reported to be flowing wash water and an unestimated amount of distillate while cleaning out from a new set of perforations at 9,675-77 ft. Tubing pressure was 3,250 lb., and casing pressure 3,350 lb. Approximately the same distance east of the discovery the company's 1 Triangle Development Co. is preparing to sidetrack and redrill after plugging back from a total depth of 11,519 ft., where the drill stem became stuck.

A new sand which extended production approximately 1,000 ft. southwest was opened in the Greens Lake field, Galveston County, with the completion of Sun 11 Hughes. The well was drilled to a total depth of 6,817 ft., and production was obtained by perforating casing at 5,465-80 ft. On a 15-hour gage flowing through a ¼-in. choke the well made 134 bbl. of 26-gravity oil.

TEXAS GULF COAST COMPLETIONS

Brazoria County

Manvel field: Texas 5 W. D. Morrison, 55 bbl., ¼-in. choke, top sand 5,637 ft., T.D. 5,680 ft.
Old Ocean field: Harrison & Abercrombie 9 Bernard River Land & Development Co., 231 bbl., ¼-in. choke, top sand 9,808 ft., T.D. 10,150 ft.
West Columbia field: Gulf 6 M. L. May, 387 bbl., ¼-in. choke, top sand 5,683 ft., T.D. 5,693 ft.
Wildcat: Skelly 1 R. D. MacDonald, dry, T.D. 7,803 ft.

Harris County

Ogburn field: Joyce Richardson et al 1-A Backen, 57 bbl. oil and 2.2 bbl. water, ⅛-in. choke, perf. casing 6,448-51 ft., T.D. 7,215 ft.
Tomball field: Humble 2 Lamport, 44 bbl., ¼-in. choke, top sand 5,555 ft., T.D. 5,565 ft.

Jackson County

Lolita field: W. L. Goldston 4 Missouri Pacific, 165 bbl., ⅛-in. choke, perf. casing 6,388-94 ft., T.D. 6,395 ft.
Humble 8-A L. Ranch, 62 bbl., 3 hr., ¼-in. choke, T.D. 5,928 ft.
Humble 10-A L. Ranch, 454 bbl., ¼-in. choke, top sand 5,928 ft., T.D. 5,933 ft.
West Ranch field: Magnolia 116-A West, 502 bbl., ¼-in. choke, perf. casing 5,747-53 ft., T.D. 5,763 ft.
Magnolia 120-A West, 414 bbl., ¼-in. choke, top sand 5,122 ft., T.D. 5,129 ft.
Wildcat: Helmerich & Payne 1 Coates, top Frio 5,324 ft., dry, T.D. 6,505 ft.

Jefferson County

South China field: Pan American 5 Fontenot, dry, T.D. 8,018 ft.
West Beaumont field: Stanolind 14 Keith & Dowlen, 29 bbl., ⅛-in. choke, top sand 5,880 ft., T.D. 5,896 ft.

Wharton County

Magnet field: Humble 32 Cockburn, 95 bbl., ⅛-in. choke, top sand 5,537 ft., T.D. 5,539 ft.
Withers field: Texas 67-B Pierce, 116 bbl., ⅛-in. choke, T.D. 5,542 ft.
Texas 68-B Pierce, 110 bbl., ⅛-in. choke, T.D. 5,376 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County

J. Newton Rayzor 1 J. W. Christian, Chenango area, William Parker Sur., drilling shale and lime 4,255 ft.

Hardin County

W. G. Christian 1 Gueydry, 5 mi. SE of Batson, M. Chavans Sur., S.D. 6,012 ft.

Harris County

George Echols et al 1 Hardison, Cypress area, J. W. Moody Sur., drilling shale 300 ft.

Matagorda County

Continental 1 C. H. Biorn, east of Markham field, I.&G. N. Sur., drilling shale 3,710 ft.
Texas 1 Hammond, Blessing area, H.&G.N. Sur., drilling shale 3,710 ft.
Texas 1 Tyson, NE discovery well Blessing field, T.D. 8,327 ft., 7-in. casing cemented on bottom.

Washington County

John A. Deering 1 H. C. Buck, James Lynch Sur., 10¾-in casing cemented 805 ft., waiting on cement.

Oklahoma Fields

(Continued from Page 85)

ft. gas, some water, T.D. 3,735 ft., P.B. to 3,680 ft., perf. 3,180-3,200 ft.
Dill: I. T. I. O. 3 Miller, NE NW SW 35-12-8e, flowed 1,260 bbl., Gilcrease 3,360-3,453 ft., Cromwell 3,548-66 ft., T.D., casing 3,514 ft.
Wildcat: Vierson 1 Leonard, SW SE NW 11-13-7e, flowed 8 bbl. oil, 3,000,000 cu. ft. gas, 35 bbl. water, casing 2,598 ft., shot 2,606-19 ft., T.D. 3,594 ft., P.B. to 2,619 ft.

Oklahoma County

Oklahoma City: I. T. I. O. 13 Trosper, NW SE SW 13-11-3w, casing 3,994 ft., shot 4,013-29 ft., pumped 13 bbl.

Osage County

Burbank pool: Magnolia 2 De Noya-B, SW SE NW 14-26-6e, pumped 100 bbl., casing 2,806 ft., shot 2,818-81 ft., T.D. 2,886 ft.

Payne County

Coyle pool: Texas 2 Minnich, E½ SE NE 11-17-1e, old well P.B. from 4,952 ft. to 4,882 ft., perf. 4,638-44 ft., dry, perf. 4,660-90 ft., flowed 280 bbl. in 7 hr. through 3-in. gate open ½ turn.
Amerada 1 Fruin, W½ SW NW 12-17-1e, old well P.B. from 4,922 ft. to 4,739 ft., perf. 4,621-31 ft., flowed 250 bbl. in 5 hr.
Amerada 2 Fruin, E½ SW NW 12-17-1e, old well P.B. from 4,890 ft. to 4,730 ft., perf. 4,589-4,601 ft., flowed 269 bbl. in 9 hr. through 17/64-in. choke.
Amerada 3 Fruin, W½ SE NW 12-17-1e, old well P.B. from 4,858 ft. to 4,691 ft., perf. 4,571-85 ft., flowed 640 bbl. in 13 hr.
Magnolia 3 Cain, W½ NE SW 12-17-1e, old well P.B. from 4,854 ft. to 4,667 ft., perf. 4,576-4,601 ft., flowed 376 bbl. in 3 hr.
Texas 1 Graham, W½ SW SW 12-17-1e, old well P.B. from 4,905 ft., perf. 4,600-40 ft., pumped 15 bbl. oil and 47 bbl. water in 21 hr.
Texas 2 Graham, E½ SW SW 12-17-1e, old well P.B. from 4,901 ft. to 4,825 ft., perf. 4,600-50 ft., pumped 84 bbl. oil and 194 bbl. water.
Texas 1 Longan, W½ NW NW 12-17-1e, old well P.B. from 5,006 ft. to 4,775 ft., perf. 4,615-45 ft., flowed 525 bbl. in 2 hr. through a 3-in. gate open ½ turn.
Texas 2 Longan, E½ NW NW 12-17-1e, old well P.B. from 4,890 ft. to 4,763 ft., perf. 4,625-45 ft., flowed 500 bbl. in 5 hr. through ¾-in. tubing choke.
Texas 3 Longan, W½ NE NW 12-17-1e, old well P.B. from 4,858 ft. to 4,783 ft., perf. 4,575-4,615 ft., flowed 500 bbl. in 5 hr. through ¾-in. choke.
Ramsey pool: Mid-Continent 1 Nottingham, NW SE 18-18-2e, old well P.B. from 4,842 ft. to 4,706 ft., perf. 4,615-33 ft., pumped 64 bbl. oil and 15 bbl. water.
Wildcat: Crosbie 1 Moore, NW NE NW 29-19-2e, Wilcox 4,834-47 ft., T.D., dry.

Pontotoc County

Oakman pool: Mitchell 1 Skervin, NE SE SE 10-4n-6e, pumped 12 bbl., Cromwell 1,398 ft., shot 775-90 ft., perf. 743-65 ft., casing 775 ft., T.D. 1,615 ft., P.B. to 796 ft.
Beebe: Mohican 1 Norvell, NW NE NE 34-5-4e, pumped 35 bbl., casing 2,500 ft., shot 2,520-2,663 ft., T.D.
Allen: Sunray 8 Adams, SE NE 19-5-8e, casing 2,474 ft., T.D. 2,480 ft., shot 2,330-40 ft., dry.
Conservation pool: Norville 1 Daner, C NE SE 24-5-6e, 14,000,000 cu. ft. gas, sand 1,993 ft., casing 2,008 ft., T.D. 2,016 ft., P.B. to 2,006 ft., perf. 1,995-99 ft.

Pottawatomie County

St. Louis district: H. Phillips 5 Bettis, NE SW SW 21-7-4e, 1,300 bbl., casing 4,274 ft., Wilcox 2,274 ft., Viola 4,010 ft.

Seminole County

Sancho pool: Jones 1 Harrison, SW NW SE 4-8-7e, flowed 40 bbl. pinched, Booch 3,210 ft., casing 3,210 ft., shot 3,220-28 ft., T.D. 3,237 ft.
Wildcat: Mohican 1 Settle, NW SW 30-7-7e, casing 1,900 ft., T.D. 2,290 ft., dry.
Searight North: H. Phillips 1 Horsley, SW SW 17-10-6e, casing 4,405 ft., perf. 4,258-77 ft., T.D. 4,635 ft., dry.

Stephens County

Wildcat: Grimes 1-A Baker, C SW NE 35-2s-6w, T.D. 1,833 ft., Arbuckle 2,792 ft., dry.
Brown 1 Dilley, C SE SE 6-3s-5w, casing 1,030 ft., Arbuckle 1,720-1,838 ft., T.D., bailed some oil and water, temporarily abandoned.
Doyle pool: Central 3 Hefner, NW NE SW 12-1-5w, rig abandoned.

Thick Section of Woodruff In Tinsley Extension

By GEORGE WEBER

JACKSON, Miss., Jan. 6.—Further extensions to the Tinsley field of Yazoo County, Mississippi, and quiet activity in wildcat areas marked the first week of the year in Mississippi and southeastern states.

Tinsley

The Tinsley field rounded 1940 with two more extensions on the southeast, both good wells in the Woodruff sand of the Selma formation. E. C. Johnston completed 1 Robertson, with 68 ft. of Woodruff section, extending production ⅜ mile farther to the southeast. Union Producing Co. reported a good gage on 2 Harris, which flowed at the rate of 1,315 bbl. daily through a ½-in. choke, proving production for another ¼ mile to the south of the southeast-extension area. The Harris well cored 76 ft. of Woodruff section, and casing was perforated in the base of the section.

Unrestricted oil production from Tinsley continues, with new outlets afforded some operators, resulting in runs to storage by offsetting operators without sufficient market demand for their crude. An increasing volume of Tinsley crude is moving by tank car to St. Elmo, Ill., at a price reported to be below the market price for Tinsley crude.

Wildcats

Active wildcats are few at present but new operations are proposed shortly, and resumption of drilling in tests shut down with fishing jobs and for other reasons may be expected during January. In Bolivar County, Ed Holmans drilled 1 Thomas to a total of 4,661 ft., ran electrical survey and in attempting to straightream a crooked hole, drilled out into a new hole to 1,842 ft. A drill-stem test made at 1,776-1,842 ft. showed recovery of 90 ft. of mud and a slight show of gas in 20 minutes, but the test was abandoned.

Proposed wildcats are gaining attention at the first of the year. The Humble Oil & Refining Co. is due to begin a wildcat in George County, on its block leased from Pascagoula Hardwood Lumber Co. Of the 35,000 acres in the block the company was to make selections based on geophysical information, and a wildcat is to be begun by January 16.

A wildcatting operation which ties Mississippi into the Wilcox play to the west in Louisiana is the proposed reworking of W. O. Allen 1 Culley, located on the Glass dome, Warren County. The test was scheduled to go 7,500 ft., but encountered salt at 4,025 ft. and was abandoned 465 ft. in the salt. The operator plans, with the help of interested parties, to reenter the well, whipstock out of the old hole about 100 ft. above the Wilcox and core the formation. The Wilcox is believed to carry oil on the dome, but it was not tested early last year. Operations are expected to get under way as soon as the rig on the Hassie Hunt 1 Montgomery, now spudding in Hinds County, is released.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Tinsley	2	1,675	10,005
Dry holes: Jackson	1	.....	2,547
Wildcat	1	.....	4,661
Total	4	.....	17,213

MISSISSIPPI COMPLETIONS

Wildcat—Bolivar County

Ed Holmans 1 Thomas, NE NE 18-24n-7w, T.D. 4,661 ft., dry, top Selma 3,545 ft., Eutaw 4,376 ft., Tuscaloosa 4,562 ft., Paleozoic 4,585 ft.

Jackson—Hinds County

City of Jackson 2 fee, 34-6n-1e, T.D. 2,547 ft., dry.

Tinsley—Yazoo County

E. C. Johnston 1 Robertson, NW SW 20-10-2, 360 bbl., 16/64-in. choke, Woodruff sand 4,967-5,035 ft., 5½-in. casing 5,035 ft., perf. 4,967-92 ft., T.D. 5,035 ft.

Union Producing Co. 2 J. R. Harris, NE NW 30-10-2, 1,315 bbl., ½-in. choke, Woodruff sand 4,894-4,970 ft., 7-in. casing 5,011 ft., perf. 4,940-68 ft., T.D. 4,970 ft.

MISSISSIPPI DRILLING REPORT

Attala County

Jones & Crosby 1 Allen, SW SW 33-13n-5e, S.D. 4,025 ft.

Clarke County

Walsingham & Earles 1 School Land, SW NW NE 16-4n-15e, report show oil in top Eutaw (?), preparing to core.

Forrest County

Fohs Oil Co. 1 Batson-Hatton, NW SE 10-1s-12w, drilling hard shale 7,321 ft.

Grenada County

James Papadakis 1 Holcomb, SE NE 13-22n-2e, T.D. 3,797 ft., S.D., drill stem stuck.

Hinds County

Hassie Hunt 1 Montgomery, 12-5-4, rigging up.

Sanford & Sellers 1 J. D. Sellers, NE SE SE 23-6n-1e, T.D. 610 ft., S.D.

Kemper County

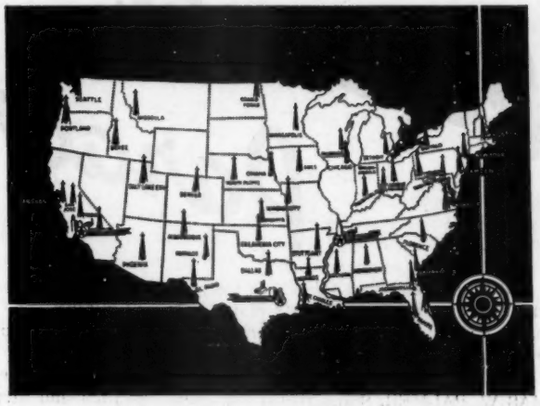
R. J. Dean et al 1 Land, NW NE 12-10n-14e, T.D. 2,102 ft., S.D.

Noxubee County

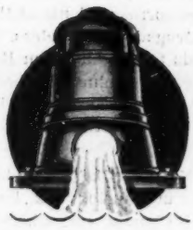
Hope & Thompson 1 Donahoo, C NW 25-16n-17e, S.D. 2,165 ft.

Sharkey County

British American Oil Prod. Co. 1 Houston estate, N½ NE SW 23-11n-7w, Fishing 4,027 ft.



First
IN NATION-WIDE SERVICE



Layne service extends to the four quarters of the globe, but here in the United States it has reached its greatest efficiency. Dotted on the map from coast to coast and from border to border are Layne men and equipment ready to solve your water supply needs.

Expansion is the order of the day. Production must not lag. Never has the need for an adequate supply of water been more vital. Old wells may be reconditioned to step up their output. It might be necessary and more economical to install a completely new well water system. In either case, Layne engineers are ready to cooperate. Their experience is valuable. They will study your needs and make dependable recommendations. They will tell you facts about Layne Wells and Pumps—facts that are proven in world-wide service.

AFFILIATED COMPANIES

Layne-Arkansas Co., Stuttgart, Ark.
Layne-Atlantic Co. . . . Norfolk, Va.
Layne-Central Co. . . . Memphis, Tenn.
Layne-Northern Co., Mishawaka, Ind.
Layne-Louisiana Co. Lake Charles, La.
Layne-New York Co. . New York City
and Pittsburgh . . . . . Pa.
Layne-Northwest Co. Milwaukee, Wis.
Layne-Ohio Co. . . . Columbus, Ohio
Layne-Texas Co. . . . Houston and
Dallas . . . . . Texas.
Layne-Western Co., Kansas City, Mo.
Chicago, Ill. . . . Omaha, Nebraska
Layne-Western Co. of Minnesota
Minneapolis . . . . . Minn.
Layne-Bowler New England Company
Boston . . . . . Massachusetts.
International Water Supply, Ltd.,
London . . . . . Ontario, Canada

Write if you want a Layne representative to call. A complete file of catalogs, bulletins and folders may be had without obligation. Address

LAYNE & BOWLER, INC.
Dept. O, Memphis, Tenn.

LAYNE

PUMPS & WELL WATER SYSTEMS
For Municipalities, Industries, Railroads, Mines and Irrigation

William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.
GIDDENS-LANE BUILDING -:- SHREVEPORT, LA.

Personal Paragraphs

A. A. HOLSTON, Stanolind Oil & Gas Co., and JOHN BERG, Pure Oil Co., geologists of Jackson, Miss., were guest speakers at a recent dinner meeting of the Shreveport Geological Society.

THOMAS W. PALMER, Standard Oil Co. (New Jersey) counsel who heads up the Latin-American division for the law department, has become a member correspondente of the Instituto da Ordem dos Advogados Brasileiros, of Brazil, which corresponds to the American Bar Association in this country. Mr. Palmer is the second United States citizen to be accorded the honor of membership in the 100 years the instituto has been organized.

JOHN S. NEILSON, independent operator of Houston, Tex., has moved to Lake Charles, La., where he will make his headquarters.

CAPT. DANIEL A. FISHER, prominent figure in the early oil excitement in the Oil City, Pa., area, marked his 100th anniversary on January 6.

FREDERICK GEORGE COTTLE has been appointed deputy chairman of the Petroleum and Natural Gas Conservation Board of Alberta, Canada.

ALBERT ROBISON has left for Colombia, South America, where he will work for the Tropical Oil Co. for the next 2 years. He spent the Christmas holidays with his family at Grainola, Okla.

ROBERT E. ALLEN, Edmonton, Alta., Canada, chairman of the Petroleum and Natural Gas Conservation Board of Alberta, spent the Christmas season with his family in California.

S. F. SHAW, consulting petroleum geologist of San Antonio, Tex., addressed the South Texas Geological Society at the regular monthly luncheon. He discussed the application of gas lift to certain types of reservoirs and the effect upon their ultimate recovery.

WILLIAM A. EBERLE, general superintendent of the Eagle works of Standard Oil Co. of New Jersey, has retired after 38 years of service. The occasion of his resignation was marked by a dinner in his honor at which FRANK W. ABRAMS, a director of the company, presided. Attendance exceeded 250.

DR. JOHN L. RICH, geological department University of Cincinnati, was the principal speaker at a meeting of the Tulsa Geological Society Monday night at the University of Tulsa. His subject was "The Tupungato Field of Argentina and Structure of the Andes Mountains."

DWIGHT B. MAPES, of Mid-Continent Petroleum Corp., Tulsa, will instruct a course in chemistry for refinery workers at Central High School. Special emphasis will be devoted to those phases of the subject which will aid refinery workers to better understand the processes and problems with which they are daily concerned.

E. F. KINDSVATER has taken over the duties of chief engineer for Phillips Petroleum Co. Moving up, as a result of this shift, M. M. HOLMGREN becomes test engineer and C. W. HUBBELL becomes assistant chief engineer.

DR. E. R. LEDERER has resigned as president and general manager of the Bradford Oil Refining Co., a position he has held since 1936. Dr. Lederer, who is a former president of the Natural Gasoline Association of America, for several years was vice president in charge of refinery operations for Texas Pacific Coal & Oil Co. For the present he will continue his residence at Bradford, Pa.

JOHN A. LLOYD has been appointed director of foreign sales for Sun Oil Co. to succeed FIELDER J. COFFIN, who retired because of ill health. Mr. Lloyd has long been associated with Sun's foreign sales and was assistant to Mr. Coffin for some time. Mr. Coffin had been with Sun since 1919, when he was manager of the New York district. Later he was manager of the New York division and became head of foreign sales in 1937.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

People living at Corpus Christi, Tex., were delighted last week when the J. M. Guffey Petroleum Co. drilled in a gas well in the White Point field with a capacity of about 30,000,000 cu. ft. daily. This is the third gas well in that district.

Construction of an oil refinery on the Island of Curacao, Netherlands West Indies, is contemplated by Royal Dutch-Shell interests.

Senator Smoot recently stated that he is in full sympathy with the oil operators of California in their movement to obtain a square deal from the Government.

20 YEARS AGO

At Van Buren, Ark., the city council has passed an ordinance prohibiting the installation of any large gasoline tank within the city of Van Buren.

Canadian Highlander, the first oil-burning steamer completed for the Dominion mercantile marine, made a successful trial trip recently at Vancouver, B. C., and was accepted.

Petroleum questions have been separated from the Mexican problem, it was learned at Washington last week, and placed in the broader field of a general oil policy.

10 YEARS AGO

Notwithstanding the many discouraging aspects of the petroleum industry during the year just ended, the industry enters 1931 in an encouraging position, having benefited from the lessons learned during 1930.

Governors of 10 oil-producing states are expected to be represented at a conference to be held in Washington, D. C., January 15, to discuss plans for solution of various problems that face the industry.

Representative Cramton (Michigan) favors restricting oil-shale land surveys on the ground that they are a waste of time because oil shale will not be of commercial value for many years to come.

WHEELER NAZRO, independent operator of Houston, Tex., left last week by boat for a trip to Pensacola, Fla.

R. T. McANALLY has been named superintendent of the Panhandle district office recently opened by Shell Oil Co., Inc., at Pampa, Tex.

LON DRISKELL, with the Near East Development Corp., in Iraq, has written his parents in Waurika, Okla., that he has seen little evidence of war in Iraq.

ROBERT ELLIS READING, junior engineer in the Lone Star Gas Co. engineering department, has been promoted to the operating department of the Community Natural Gas Co.

W. H. HODGES, JR., Elm Grove, La., prominent North Louisiana oil man and planter, has been appointed director of the new Louisiana Department of Conservation, with jurisdiction over wildlife, forestry, fish and oyster.

D. H. BOLIN, well-known Wichita Falls, Tex., oil operator, has been named local adviser for occupational deferments in connection with the selective-service act, by Governor O'Daniel. He will serve in the appeal-board area, which comprises 23 counties with headquarters in Fort Worth.

FRANCIS L. JEHLE, vice president of the Globe Oil & Refining Co., Wichita, Kans., this week was made a Knight of the Order of the Holy Sepulchre of Jerusalem in a ceremony at Blessed Sacrament Church in Wichita. The honor was conferred on Mr. Jehle by Pope Pius XII because of his charitable work.

W. MORTIMER SMITH, of Landreth Production Corp., Fort Worth, Tex., is reported critically ill in a Los Angeles, Calif., hospital, where he recently underwent an operation.

R. L. BATES, Texas Co. geologist and vice president of the Midland Geological Society, has resigned his position at Midland, Tex., and has left for Socorro, N. M., where he will be associated with the New Mexico Bureau of Mines and School of Mines.

C. H. MANNEY, manager of the Gas Service Co. at Fort Scott, Kans., was recently elected a member of the board of directors of the Fort Scott Chamber of Commerce. He has served on the industrial committee of the chamber for the past 2 years.

SOL SMITH, petroleum engineer with the Railroad Commission of Texas, has been transferred from the Pampa, Tex., office to the Wichita Falls, Tex., office. For the present he will be in charge of the gas-oil survey in the K.M.A. field.

BILL JACK CURRY, a June 1940 graduate of Texas A. & M. College, has been named production engineer for Lone Star Gas Co., Dallas, Tex., in the Opelika field of Henderson County, eastern Texas, according to an announcement by L. T. POTTER, chief production engineer for the company.

OLIN CULBERSON, newly elected member of the Railroad Commission of Texas, was sworn in January 2, and declared he favored oil production within the demand estimate of the U. S. Bureau of Mines. C. H. WHITE, veteran oil man with South American experience, was named deputy supervisor at Mount Pleasant, Tex., to succeed F. H. PIERSON, resigned.

20 Years an Engineer

Paul Guarin, assistant production manager of Shell Oil Co., Inc., Houston, Tex., and newly elected chairman of the Houston chapter of the American Petroleum Institute, Division of Production, was born in Harrisburg, Pa., in 1900. He was graduated from Penn State College in 1921 as a mechanical engineer, and started his career in the oil business the same year when he went to work with Layne & Bowler Co. He resigned in 1923 and for the next 2 years was associated with the Kirby Petroleum Co., Houston, Tex., and worked for several drilling contractors specializing in rotary drilling in various parts of the state. In 1925 he became associated with Sun Oil Co., and was transferred to Venezuela, South America, as drilling superintendent.

PAUL GUARIN

Mr. Guarin's connection with the Shell company began in 1926, when he joined the engineering department at Tulsa. He was later promoted to district superintendent in charge of development in the Lucien field, Oklahoma. His next promotion was to superintendent of the Kansas division, where he was stationed for several months before he was transferred to Kilgore, Tex., as division superintendent in the East Texas field. Mr. Guarin went to Houston in 1936 as chief mechanical engineer, and was promoted to his present position in February 1938.

He is married, has two daughters, and enjoys an occasional deep-sea-fishing trip.

D. A. HULCY, president of the Lone Star Gas Co., has been elected a director of the Dallas, Tex., Chamber of Commerce.

DAVID H. DUKE, exploitation engineer at Centralia, Ill., for Shell Oil Co., has been called to active duty as a first lieutenant with the Sixty-third coast artillery at Galveston, Tex.

HARRY H. ASEL, United Natural Gas Co., Shreveport, La., has been retired from service after 28 years. Mr. Asel, a resident of Sigel, began his employment with United in 1912, when he entered service as a teamster's helper.

D. B. COLLINS, general manager of the production department of Shell Oil Co., Inc., Houston, Tex., and G. E. ARCHIE, also of the production department, have returned from a business meeting at Emeryville, Calif.

LEON C. MOORE and PATRICK J. SULLIVAN, employes of the United Natural Gas Co., at Oil City, Pa., have been placed on the annuity roll of the company. Mr. Moore's service covers 23 years, and that of Mr. Sullivan 36 years.

DAVID D. FELDMAN heads a group of oil men who have purchased the interests of Glassell & Glassell, of Shreveport, La., in oil properties in the Evangeline field, Acadia Parish, South Louisiana. The sale price was $1,200,000.

LARRY SEAMAN, formerly head of the geophysical department of Sinclair Prairie Oil Co.'s Fort Worth, Tex., office for 5 years, has been promoted to head of the company's Mid-Continent geophysical division. He has moved to the Tulsa office of the company.

WILLIAM KECK, JR., and Mrs. Keck have returned to their California residence following a combined business and pleasure trip to New Zealand, where Superior Oil Co., of which Mr. Keck is vice president, is preparing to undertake exploration work.

WINTHROP ROCKEFELLER, grandson of the late John D. Rockefeller and heir to a huge fortune, intends to resign his position in the foreign department of the Socony-Vacuum Oil Co., Inc., and enlist in the Army. He was expected to go before his local draft board last week for physical examination.

Shifts: HOMER C. MOORE, geologist, Texas Co., from Cadiz, Ohio, to Vandalia, Ill.; A. E. JUDD, manager, Trijoy Drilling Co., from Waterloo, Ill., to A. E. Judd Drilling Co., Carlyle, Ill.; E. MOOTZ, Western Construction Co., from Louisiana, Mo., to Hoisington, Kans.; CURTIS C. BALDING, engineer, Max B. Miller Co., from New York City to Rawalpindi, Punjab, India; R. L. WALES, engineer, Texas Co., from Waynesburg, Pa., to Auburn, Ind.; MAX LYON, engineer, Carter Oil Co., from Mandan, N. D., to Beloit, Kans.; ROBERT L. BUCHANAN, Cia. de Petroleo Lago, from La Salina, Venezuela, South America, to Lago Oil & Transport Co., Ltd., Aruba, Curacao, Netherlands West Indies; G. E. HIGGINS, geologist, Caracas Petroleum, S.A., from Caracas, Venezuela, South America, to Trinidad Leaseholds, Ltd., Port-of-Spain, Trinidad, British West Indies.

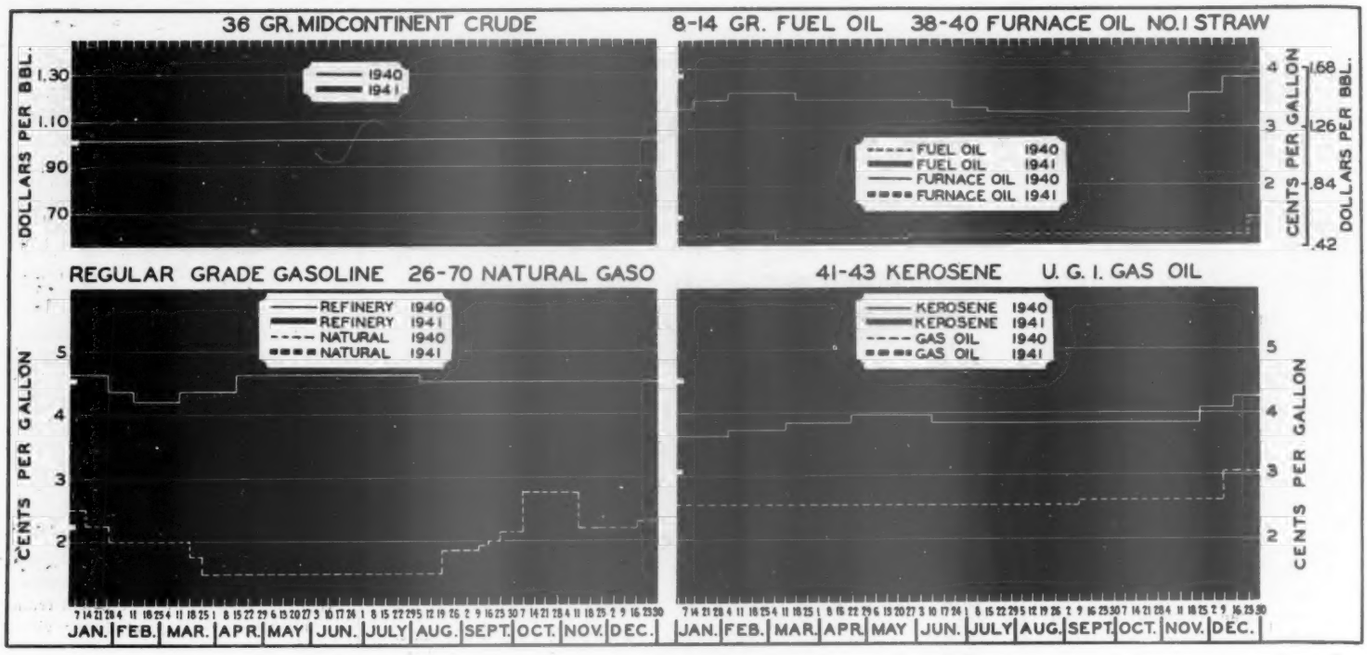
SAMUEL D. ROBISON, one of the few surviving pioneers who operated in the Pennsylvania fields shortly after Drake brought in his discovery well, celebrated his ninetieth birthday anniversary on Christmas Day at his home on Brightwood Road, between Pittsburgh and Coraopolis, Pa. Mr. Robison is still in the oil business and intends to stay in it. He has just been reappointed to the county planning commission for a new term.

S. S. "STAN" LEARNED, of Phillips Petroleum Co., has been advanced from the position of chief engineer to assistant manager of the company's newly organized gasoline pipe-line department. He will assist A. W. HUBBELL, manager. All operations of what were formerly the Phillips Pipe Line Co., Illano Co. and Hoosier Terminal Co., now come under the supervision of the gasoline pipe-line department, headed by C. R. MUSGRAVE, vice president.

S. J. ROTONDI, Mount Pleasant, Tex., partner with F. R. JACKSON as an independent oil producer, has been hospitalized in Dallas with influenza.

R. J. HULL, former New England manager of Cities Service Oil Co., has been appointed sales manager of the company's New York division. PARKER H. KENNEDY, who formerly headed the New York district sales department, succeeds him. O. W. F. HICKS has been named New York district manager, C. A. GIBLIN, Newark, N. J., district manager, and A. W. ROWE, as Boston, Mass., district manager.

Several promotions have recently been made in the production department of Phillips Petroleum Co., Bartlesville, Okla.; W. D. DAVIS, junior engineer to assistant to the district superintendent at Bartlesville; D. A. CHASE is district superintendent for western Kansas; C. M. La LONDE is assistant to district superintendent in western Kansas; A. W. PAINE is assistant to district engineer at Billings, Okla.; G. D. McCULLOUGH is subforeman at Burbank, Okla.; J. F. HENDRICKSON is assistant to district superintendent in the Panhandle field, and R. C. CARNES is subforeman at Corpus Christi, Tex.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Expanding Demand for Distillate Fuels Benefits Inland Suppliers

By H. STANLEY NORMAN

TREND of the inland-refinery market pointed upward this week. Tangible evidence of price improvement was confined to the distillate fuel-oil products but the higher bulge was evident throughout the list, including gasoline which is receiving new strength from crude-oil advances in the northern part of the Middle West.

Distillate fuel oils advanced approximately an eighth of a cent per gallon in the Group 3 territory. The demand is strong from all consuming sections of the Middle West which draw all or a part of their requirements from the inland refining district. Contract customers have been ordering shipments at an accelerated rate during the past several days. Resumption of business at peak-winter rates is linked with turn of the year and the dismissal of inventory considerations from current movement. Spot business from the Chicago, Detroit, Milwaukee and other large consuming centers of the Middle West is filtering into the Group 3 refining district at an increasing rate. Numerous customers are seeking distillate fuel-oil supplies in this section for the first time in 2 years.

Reversion of the demand to the Group 3 refining section is an indication that independent plants in Illinois are no longer qualified to meet entirely the Chicago district demand. There are two factors involved. One is the decline of production in Illinois and the other is the increase in demand.

Weather Modifies Improvement

Comparatively mild winter temperatures in large parts of the Middle West consuming section have prevented the distillate fuel market from registering more vigor. Despite the lack of weather conditions favorable to light fuel-oil consumption such as prevailed in January and February a year ago, the refinery market for distillates has increased approximately three-eights of a cent since October. Kerosene, range oil and No. 2 straw were advanced an eighth of a cent at both extremes of the market range during the week.

Demand for residual fuels is continuing on a firm basis following the increase of approximately 10 cents per barrel 2 weeks ago. Heavy fuels have been an unimportant factor in the Group 3 spot market for several years. Demand for residuals appears to be increasing at a more rapid rate than most other products which is reflected back into markets heretofore more or less dormant.

One of the most encouraging factors in the Group 3 market at the present time is the comparatively strong demand for motor fuel and the indication that buyers are anticipating higher prices. The indication is supported by nothing more tangible than a decline in the bickering for price concessions but seasoned sales managers report this to be one of the most reliable barometers available. Then too, there has been improvement in the 1941 contractural relationships between Group 3 suppliers and northern customers.

Recycling Important Factor

Some of the recent improvement in tone of the Group 3 market appears to be based on the conclusion that some form of regulation on distillate production will be enacted by the Texas Legislature. Distillate from recycling plants in Texas, particularly, and other areas in proportion to their production, have been exercising increasing influence on the motor-fuel market. Conversion of recycle-plant production into acceptable motor fuel is a relatively inexpensive process. Inclusion of recycle stock in general refinery balance tends to reduce the overall cost of refining and makes for price concessions on gasoline that in turn reacts on the whole tank-car market. Affect of recycling operations on the motor-fuel market is indirect but has been a potent factor in recent months. Consequently, the possibility of enactment of regulatory measures in Texas exerts formidable influence on 1941 gasoline markets.

Natural-gasoline prices are steady at 2⅝ cents per gallon for 26-lb. material in Oklahoma and 2 cents in Texas for northern shipment. The Oklahoma producers are in position to demand premiums above the interstate price range in spot sales to nearby refineries. The premiums generally amount to the freight differential which accrues to the suppliers under the present approximate balance of supply and demand.

Refined Oil Market Barometer

Motor fuel is showing contra-seasonal strength in practically all refining and major consuming districts of the country, excepting the Gulf Coast where the drastic contraction of export business remains a market enigma. Fuel-oil prices were on an elevated scale in a large part of the country this week. Strength is particular in evidence at inland refining points and in the Middle West consuming section.

MID-CONTINENT: Distillate fuel-oil prices are up an eighth. Supplies are limited.

GULF COAST: Distillate fuel-oil price touches new low of 3 cents.

CALIFORNIA: Movement of motor fuel is following routine lines. Fuels active.

PENNSYLVANIA: Gasoline demand exceptionally strong for this season.

CHICAGO: Subnormal kerosene prices raised to offset tank-car advances.

Contract Price Advanced for Residual Fuel on East Coast

By J. P. O'DONNELL

NEW YORK, Jan. 7.—Refined-product prices in the East Coast district exhibited general strength with the opening of the new year. Refinery and terminal prices were unchanged at previous levels which, in view of the existing high tanker rates, are comparatively low. Bunker C fuel oil was stronger and gasoline exhibited further contraseasonal strength.

The contract price of Bunker C fuel oil was raised to $1.25 per barrel effective January 1, the first change made in this product for months. The position of bunker fuel was reported increasingly tight and there were some reports of suppliers asking $1.35 per barrel. However, the existing spot-market price of $1.25 was generally quoted.

Last week's advance in Bunker C fuel-oil quotations was the only major change of the week. It is the only major product in this market which is enjoying a better price position now than a year ago despite the general increase in demand for all products. A comparison of prices as of January 1, 1941, and as of the same date a year ago follows:

Product—	1941	1940
Gasoline (72)	$.055	$.065
No. 2 fuel oil	.049	.051
Bunker C	1.25	1.15
Kerosene	.055	.056
Diesel oil	2.00	2.10
Wax (122-4)	.0275	.0675

The contraseasonal strength of gasoline was laid to continued demand and reduced production as refiners expanded their fuel-oil yield at the expense of gasoline. As a result of this combination in addition to high transportation rates which have limited receipts of Gulf Coast gasoline at East Coast ports, the statistical position of motor fuel on the Atlantic seaboard is the strongest in many months. Consistent withdrawals in recent weeks including a reduction of 245,000 bbl. in the last week of 1940 have brought East Coast inventories down to 17,500,000 bbl., almost 1,400,000 bbl. lower than they were at the beginning of 1940.

Failure of refinery prices to improve despite favorable stock trends is laid in the main to disturbed retail conditions which remain unsatisfactory in a large part of the eastern territory. Branded regular-grade gasoline is still obtainable at many stations throughout the metropolitan New York area, Connecticut and other New England cities, at less than 15 cents per gallon.

Motor fuel in the 72-74-octane range in the New York Harbor area is quoted at 5.5 cents per gallon by most tank-car suppliers though some are asking 5.75 cents. A continuation of the present trend in the gasoline market will undoubtedly insure higher prices.

Easing of the retail market for heating oil failed to adversely affect the refinery market and the latter quotations continued within a range of from 4.9 cents to 5.1 cents per gallon. No. 2 fuel oil was offered tank-wagon buyers in metropolitan New York at around 6 cents. Ruling price before the break in the weather was 6.8 in the city and 7 cents at suburban points. A revival of normal winter weather is expected to return retail prices to previous levels.

The temporary slump in heating-oil demand made no impression on record tanker rates. On the contrary, the dirty-tanker rate was reported up to 66 cents a barrel, 1 cent above previous levels. Clean-tanker chartering last week continued on the basis of 70 cents for gasoline, 75 cents for kerosene and 80 cents for No. 2 fuel oil.

Attribution of higher fuel-oil prices to increased tanker rates was declared false by Harriet Elliott, head of the consumer-protection division of the National Defense Advisory Commission, who issued a statement on the results of a preliminary investigation into higher charges. Miss Elliott's statement blamed the increase in prices entirely to a greater demand. She pointed out that transfer of registry and requisitioning by the Navy has engaged but 13 per cent of the United States tanker tonnage and also that 90 per cent of the oil transported from Gulf to North Atlantic ports is carried in tankers of major companies which do not pay spot charter rates.

The statement revealed that while retail prices have advanced as much as 87 cents per 100 gal. for No. 2 fuel oil delivered at principal East Coast cities in the 3 months of last fall, they were still well below levels attained at the end of the previous consuming season. It was pointed out that the retail price in Boston had risen to $7 per 100 gal. on December 15, an increase of 87 cents from September 15 but 5 cents lower than on March 15, 1940. Other changes were less marked. In New York the price had risen to $6.89, up 77 cents, but 25 cents below last March; in Philadelphia it had risen 42 cents to $6.75 but was 42 cents below March 15, and in Baltimore the price was up to $6.75, an increase of 75 cents but still 25 cents below the high reached during last March.

Kerosene prices were reported unchanged in the New York Harbor area but demand was reported satisfactory. The tank-car price in this area is still 5.5 cents though Pennsylvania refiners raised their quotations ⅛ cent during the past week. This advance is regarded as a reflection of increased crude-oil costs as well as of sustained demand. Pennsylvania refiners may encounter even higher crude-oil costs in the near future.

Furnace Oil Sold on Gulf at New Low Price of 3 Cents

HOUSTON, Tex., Jan. 7.—Burning oil meeting No. 2 specifications was purchased on the Gulf Coast the past week at 3 cents, a new low for the season and an eighth-cent under the low of quotations Gulf Coast refiners have been trying to maintain. Although the quantity of material involved was not enough to establish the market at 3 cents, the sagging was in line with the weakness that has been indicated in burning oils for several weeks. Further accumulation of burning oil in the hands of independent Gulf Coast refiners was reported during the week due to continued high tanker rates that kept eastern markets generally closed to these suppliers.

Residual fuels were offered freely as low as 75 cents in cargo lots from some sources. Other sellers indicated, however, they would be unwilling to take less than 80 cents and expressed hope that industrial expansion in the country as a result of defense preparations and announced intentions of this Government to supply England with increased war supplies sooner or later would stimulate demand for fuels and thus bolster the price.

The sagging of burning oils extended to kerosene which was easy at 3⅝ cents. Buyers reported being offered material below that figure. Gasoline quotations still are being held mainly on the basis that lower quotations would not stimulate any additional demand. Practically no material is being sold on the spot market. The volume of material moved on contract coverage is fairly heavy. Spot demand from the East Coast has slumped.

A.P.I. Weekly Refinery Statistics

Week Ended January 4, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	18,193,000	10,811,000	15,635,000	583,000
Appalachian	91.0	3,204,000	339,000	522,000	116,000
Ind., Ill., and Ky.	90.2	15,112,000	3,120,000	4,340,000	624,000
Okla., Kans., and Mo.	76.9	7,327,000	2,118,000	1,386,000	262,000
Inland Texas	59.6	1,916,000	1,611,000	493,000	111,000
Texas Gulf	89.2	12,972,000	8,256,000	7,260,000	901,000
Louisiana Gulf	97.6	2,697,000	2,368,000	1,345,000	111,000
N. Louisiana and Ark.	51.5	509,000	453,000	305,000	46,000
Rocky Mountains	56.0	1,104,000	435,000	152,000	32,000
California	87.3	15,869,000	71,187,000	10,190,000	471,000
Total reported	86.2	78,903,000	100,698,000	41,628,000	3,257,000
Est. unreported	.....	6,150,000	1,750,000	775,000	343,000
*Est. total	.....	85,053,000	102,448,000	42,403,000	3,600,000
*Est. total previous wk.	.....	83,274,000	102,620,000	42,266,000	3,585,000
*Jan. 5, 1940	.....	83,911,000	105,239,000	32,782,000	3,370,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended December 28, 1940	261,552,000 barrels
Week ended December 21, 1940	262,488,000 barrels
Week ended December 30, 1939	237,742,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of January 7, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Chicago, Ill.	14.6	12.6	4.5	10.0
Decatur	14.6	13.1	4.5	10.0
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.5
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.8
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	8.1
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.8	11.8	4.5	8.5
St. Louis*	14.7	13.2	4.5	9.5
St. Joseph	14.9	13.0	4.5	8.4
Wichita, Kans.	13.8	12.3	4.5	7.2

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-790 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline: Cons'r tank wag.	Gasoline: Dlr. vided dlr.	Gasoline: Incl. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Atlantic City	11.00	12.60	4.5	8.1
Newark	11.00	12.60	4.5	8.1
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.75
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	9.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6.5	11.2
Richmond	13.55	16.05	6.5	11.0
Roanoke	14.75	17.25	6.5	11.0
Charles'n, W. Va.	14.05	16.55	6.5	12.6
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	15.00	7.5	10.55
Hickory	16.95	18.45	7.5	9.75
Mt. Airy	16.80	16.00	7.5	10.95
Raleigh	16.15	16.00	7.5	10.25
Salisbury	16.45	14.50	7.5	10.65
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	(*)
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline: Cons'r tank car	Gasoline: Net dlr.	Gasoline: incl. tax	Kero. tank wag.
Atlanta, Ga.	14.0	14.0	7.5	9.0
Augusta	15.5	15.5	7.5	9.5
Macon	15.0	15.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	9.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	16.0	16.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	9.0
Louisville	15.0	15.0	6.5	8.5
Paducah	14.0	14.0	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Philadelphia, Pa.	12.5	13.5	5.5	10.0
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
*Scranton	13.0	14.5	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.		14.0	5.5	10.5
Wilmington		13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline: Tank truck	Gasoline: Serv. sta.	Gasoline: Incl. tax	Kero. tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Albany	12.3	13.0	5.5	8.0
*Met. New York	12.3	12.5	5.5	8.3
Buffalo	12.4	13.4	5.5	7.9
Rochester	12.8	13.4	5.5	8.5
Syracuse	12.5	11.2	5.5	8.9
Portland, Me.	11.4	13.0	5.5	8.4
Manchester, N.H	12.9	12.6	5.5	9.2
Burlington, Vt.	11.6	12.3	5.5	8.6
Boston, Mass.	10.4	11.2	4.5	8.4
Worcester	11.0	12.0	4.5	8.0
Hartford, Conn.	11.3	12.0	4.5	7.9
New Haven	11.1	11.8	4.5	7.4
Providence, R. I.	10.4	12.2	4.5	8.4

*Does not include 2 per cent city sales tax, which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline: Tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Denver, Colo.	14.5	5.5	10.5
Grand Junction	16.5	5.5	12.0
Pueblo	15.5	5.5	9.0
Casper, Wyo.	16.5	5.5	11.5
Cheyenne	12.0	5.5	11.0
Billings, Mont.	16.5	6.5	12.0
Butte	15.5	6.5	13.0
Great Falls	15.5	6.5	12.0
Helena	15.5	6.5	12.5
Salt Lake, Utah	16.0	5.5	14.0
Boise, Idaho	†18.6	6.5	16.0
Twin Falls	†19.6	6.5	16.5
Albu'que, N. M.	*16.0	7.0	9.5
Roswell	*14.0	7.0	8.0
Santa Fe	‡17.0	7.5	9.5

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
New Orleans, La.	14.25	16.75	8.5	†11.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	11.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline: Tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	12.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Omaha	17.4	15.9	6.5	9.5
McCook	17.0	14.4	6.5	9.0
Norfolk	17.5	15.4	6.5	9.9
North Platte	17.8	15.5	6.5	10.2
Scottsbluff	17.4	14.5	6.5	10.8

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Tank-Wagon Changes

Standard Oil Co. of Kentucky increased the tank-wagon price of regular gasoline 1 cent per gallon at Paducah, Ky., December 21 and raised the tank-wagon quotation on third-structure motor fuel 1 cent at Augusta, Ga., December 20 and at Paducah December 21.

Standard Oil Co. of New Jersey reduced the kerosene tank-wagon price 1.3 cents per gallon at Hickory, N. C., December 27.

Standard Oil Co. (Indiana) advanced kerosene tank-wagon prices 0.5 cent at subnormal points January 6. Points at which the 0.5-cent per gallon increase applied are Decatur, Ill.; Mankato, Minn.; Green Bay, Wis.; Detroit, Mich.; Kansas City, St. Louis, and St. Joseph, Mo., and Wichita, Kans.

Atlantic Refining Co. discontinued the voluntary discount of 1 cent per gallon granted dealers in the Philadelphia, Pa., area December 31.

Socony-Vacuum Oil Co., Inc., increased the commercial consumer tank-car price of gasoline 0.1 cent per gallon and reduced the dealer tank-wagon price 0.2 cent per gallon at Albany, N. Y., and 0.3 cent per gallon at Boston, Mass., December 31. The consumer tank-car price was reduced by the company December 31 at the following points: Portland, Me., off 0.3 cent; Burlington, Vt., 1.2 cents; Boston, 0.1 cent; Worcester, Mass., 0.3 cent; Hartford, Conn., 0.2 cent New Haven, 0.1 cent and Providence, R. I., 0.3 cent per gallon. The company increased the tank-wagon price of kerosene 0.2 cent per gallon at New York City December 11 and reduced the price 0.5 cent at Worcester, Mass., December 20.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of January 7, 1941

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400 grades:		
72-74 octane (regular)	.04½	.04⅝
63-66 octane	.04¼	.04⅜
60 octane and below	.03¾	.04

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400	.03¾	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04¼	.04½
60 octane and below	.03⅞	.04⅛

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)		.04⅝
60 octane and below		.04

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04¼	.04½
60 octane and below	.03¾	.04⅛
60-62 400 grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04⅛	.04½
60 octane and below	.03¾	.04⅛

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)		.06
72-74 octane		.05¾

CALIFORNIA (domestic movement)—

88-60 400, 65 oct. and higher	.05½	.07¼
84-58 U. S. Motor	.04½	.06¼

EAST COAST (domestic)—

U. S. Motor grades:		
New York (Bayonne)*	.05½	.06½
Philadelphia	.06	.07
Boston	.05¾	.06¼
Baltimore	.05¾	.06¾
Charleston, S. C.	.05¾	.06½

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
72-74 octane		.03½
70-72 octane	.03¼	.03½
68-70 octane		.03¼
65-67 octane	.03⅛	.03¼

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02⅜
Grade 18-55	.02¾	.02⅞

NORTH TEXAS—

Grade 26-70		.02
Grade 18-55		.02⅜

CALIFORNIA—

75-85 375-390	.04½	.05¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.03⅞	.04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.04¼	.04⅜
41-43	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅛

ARKANSAS (Ark. and N. La. del.)—

41-43	.04	.04¼

PENNSYLVANIA (inland refineries)—

46	.05⅛	.05⅜
45	.05⅛	.05¼

CHICAGO (Based on Group 3)—

42-44	.04¼	.04⅜
41-43	.04⅛	.04¼

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04⅛	.05½

NEW YORK (Bayonne, N. J.)—

41-43	.053	.055

GULF COAST (domestic)*—

41-43	.03⅝	.03⅞

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.04	.04⅛
No. 1 prime white, 38-42	.03⅞	.04
No. 1 straw, 38-40	.03⅞	.04
No. 2 straw, 32-36	.03½	.03¾
No. 3 zero to 10, 28-32	.03⅝	.03½

NORTH TEXAS—

No. 1 prime white, 38-42	.03¾	.03⅞
No. 1 straw, 38-40	.03⅝	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03½	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.03½	.03⅝

CHICAGO (Based on Group 3)—

Range oil	.04	.04⅛
No. 1 prime white, 38-42	.03⅞	.04
No. 2 straw, 32-36	.03½	.03¾
No. 3 zero to 15, 28-32	.03⅝	.03⅝

NEW YORK (Bayonne, N. J.)—

*No. 1	.053	.055
*No. 2	.047	.049
*No. 4	.047	.049

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH TEXAS—

U.G.I. gas oil, under 35	.03	.03⅛
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial		.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 8-14	.60	.65

PENNSYLVANIA (inland refineries)—

36-40	.04½	.05

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.55	.70
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.75	.80

GULF COAST—

No. 2 fuel	.03½	.03⅜
43-47 diesel	.03¼	.03½
48-52 diesel	.03½	.03⅝
53-57 diesel	.03⅝	.03⅞
58-and-above diesel	.03⅞	.04
Diesel bunkers		1.50
Bunker C (bulk cargoes)	.75	.80
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.05
28-30 diesel (lighterage 6¼c per bbl.)		2.00
28-30 diesel (tank cars)	.047	.049
Bunker C (to ocean-going ships in N. Y. Harbor	1.15	1.25
Industrial fuel (tank cars)		.046

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.18
150-160 D, 0-10		.13½
150-160 D, 10-25		.13
100-110 D, 0-10		.13
100-110 D, 10-25		.12½
Steam refined:		
600 dark green (untreated)		.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.14½
15 pour point		.13½
25 pour point	.12	.13
Steam refined:		
600		.08
650	.08	.08½
600 flash	.09	.09½
630 flash	.11	.12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.08
180-3		.08½
200-3		.08½
250-3		.10
280-3		.10½
280-4		.10
300-3½		.11
350-3½		.11½
400-3½		.12
500-3½		.12½
600-3½		.13
100-2½ paraffin oil, 10-25		.05¼
10-25 pour point:		
200-3		.08
250-3		.09½
280-3		.10
280-4		.09½

GULF COAST—

Pale oils:		
100-3	.05⅛	.05⅛
200-3	.07⅛	.07⅛
300-3	.07½	.07⅝
500-3½	.08¼	.08½
750-3½	.08⅝	.08¾
1,200-3½	.08¾	.08⅞
2,000-4		.09
3,000-4		.10½
Red oils:		
200-5-6	.06⅞	.07
300-5-6	.07¼	.07½
500-5-6	.08	.08¼
750	.08⅜	.08½
1,200-5-6	.08½	.08⅝

CALIFORNIA (moving to dom. market)

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07½	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis., at 70° F., 3 color, 400-405 flash:		
Zero pour point		.22½
10 pour point		.21½
15 pour point		.20½
25 pour point	.19	.20
200 vis., at 70° F., 3 color:		
Zero pour point		.24½
10 pour point		.23½
15 pour point		.22½
25 pour point	.21	.22

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.02½	.02¾

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.02¾	.02⅞
124-126 (A.m.p.) w.c. scale	.02¾	.02⅞

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p.) wax	.0560	.0570
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.		.02⅞
124-126 (A.m.p.) y.s.		.02⅞
Petrolatum in barrels, carload lots:		
Dark green	.02125	.02625
Amber	.02375	.02875
Extra amber	.02625	.03000
Lily white	.04375	.05125
Snow white	.05125	.06000
Cream	.03375	.04125

Export Prices

GASOLINE

GULF COAST—

U. S. Motor		.03⅝
60-62 400		.03⅝
61-63 390	.03⅞	.04
64-66 375	.03⅞	.04

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.05½	.05⅝
65-69 octane	.05¼	.05½
60-65 octane	.04½	.05

KEROSENE

GULF COAST—

41-43 water white	.03⅝	.03¾

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.s. in bbl.)—

Cylinder stocks:	
600 S.R. unfiltered	.16
630 S.R. unfiltered	.17
600 flash, S.R.	.18
650 flash, S.R.	.20
Bright stock:	
Light, 25 pour point	.20½

NEUTRAL OIL

200-3 color	.27
150-3 color	.25½

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.05600
125-127 A.m.p.		.05600
128-130 A.m.p.		.05850
133-135 A.m.p.		.06150
135-137 A.m.p.		.06400
Crude scale:		
124-126 w.s.	.02¾	.02⅞
124-126 y.s.	.02¾	.02⅞

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940 High	1940 Low	Week ended Jan. 4 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1939	1938	1939 High	1939 Low	1938 High	1938 Low
58½	38½	47¼	46¼	46⅝	Amerada Corp.	788,675	N.P.	50cQ	1-31-41	$2.00	$1.56	$2.07	74½	50	78	55
27⅛	18¼	24⅜	23¾	23⅞	Atlantic Refining	2,663,999	$25	25cQ	12-16-40	1.00	1.66	1.40	24¾	18⅛	27⅝	17¾
16⅝	8½	10	9⅜	10	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.25	1.39	—.85	21	10¼	23¾	12⅛
13⅜	7⅛	9	8	9	Barnsdall Oil Co.	2,558,779	$5	15c	12-9-40	.90	.76	1.26	19½	11⅛	21⅜	10⅛
8⅛	5½	5⅞	5½	5⅞	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	2-15-41	.80	.55	.55	9⅞	6½	10⅜	7
25	16⅛	19½	18¾	19¼	Continental Oil of Delaware	4,682,572	$5	25cQ	12-23-40	1.00	1.35	1.10	31½	19⅞	35¾	21¼
6⅞	3⅜	4⅜	3⅞	4⅜	Houston Oil	1,098,618	$25		10-17-30		.43	.83	9⅜	4½	9¾	5
14⅜	9	11¼	10¼	11¼	Lion Oil Refining	435,815	N.P.	25cQ	12-31-40	1.00	1.50	2.09	18⅛	10	25⅛	15⅝
17⅜	11½	14½	13⅞	14½	Mid-Continent Petroleum	1,857,912	$10	40c	12-2-40	.60	1.42	.56	18	11⅛	22⅝	12¼
11¾	7⅛	11	10½	10¾	Mission Corporation	1,378,645	$10	25c	12-20-40	.65	.87	1.04	14⅞	8¾	17¾	10⅝
9¾	4⅝	6½	5¾	6⅜	National Supply	1,155,517	$10		12-22-37	....	—.87	—.79	15½	5⅝	23	12½
8¾	5⅜	7⅝	7⅛	7⅝	Ohio Oil Co.	6,563,377	N.P.	25c	12-14-40	....	—.10	.25	10½	6	14⅞	8⅞
8⅞	5½	6¾	6⅛	6¾	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	.40	.81	1.22	11⅞	7	15⅞	10¼
10½	6¾	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	....	1.10	.08	8¾	5	9¼	6¼
41¾	27⅛	41¼	40½	40⅞	Phillips Petroleum	4,449,052	N.P.	50cQ	11-30-40	2.00	2.21	2.03	46½	31¼	44⅜	27¼
22¾	15	16½	16⅛	16½	Plymouth Oil Co.	1,038,633	$5	25c‡	12-23-40	§1.40	2.38	2.59	24	17⅛	25⅜	15
11½	6¾	8½	8	8⅜	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.11	.38	11⅜	6⅛	13½	8¼
9¼	5⅞	8¾	8½	8⅝	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.65	.51	10¼	6⅝	9⅞	5
20	11	13½	12⅝	13½	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	12-14-40	1.00	1.40	1.52	24⅜	15½	27½	15½
13⅛	7⅝	11⅞	10⅞	11½	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.50	.77	.72	17¼	9⅞	18⅜	10
23¼	12¼	22¼	20¾	22	Skelly Oil	995,349	$15	50c	12-20-40	.75	1.99	2.27	29½	15½	34¾	18½
12½	7⅛	9⅛	8⅛	9⅛	Socony-Vacuum	31,206,071	$15	25cSA	9-16-40	.50	1.10	1.29	15⅛	10¼	16⅝	10¾
26⅛	16¼	20¼	18	20	Standard Oil of California	13,003,953	N.P.	25cQ	12-16-40	1.10	1.38	2.22	33⅝	24¼	34⅞	25⅛
29	20¾	26¾	25⅝	26⅝	Standard Oil (Indiana)	15,272,020	$25	50c†	12-16-40	1.25	2.23	1.82	30	22¾	35½	24⅝
46½	29⅞	36¼	33⅜	35⅜	Standard Oil of New Jersey	27,280,998	$25	75c†	12-16-40	1.25	3.26	2.86	53½	38	58⅝	39⅜
65⅞	46¾	59¼	57½	57½	Sun Oil	2,434,863	N.P.	25cQ	12-16-40	1.00	2.74	1.07	66	45¾	65⅛	45
2½	1⅛	1⅝	1½	1⅝	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	....	.04	.24	3⅝	1⅜	4¼	1¾
47⅝	33	40½	39½	39½	Texas Corp.	10,876,139	$25	50cQ	1-2-41	2.00	3.02	2.13	50¾	32½	49⅝	32⅝
4¼	2½	3⅛	3	3⅛	Texas Gulf Producing Co.	888,147	N.P.	10c	12-14-40	.20	.69	.86	5⅜	3¼	5⅞	2⅝
8⅝	5⅜	5⅞	5½	5⅞	Texas Pacific Coal & Oil	888,236	$10	10c	12-2-40	.40	1.00	1.16	11⅜	7	12½	7
12	8¾	10¼	9⅝	10¼	Tide Water Associated	6,371,827	$10	15c	12-2-40	.80	1.05	1.28	14¼	9½	15⅝	10⅛
17½	12	13⅞	12⅛	13⅞	Union Oil Co. of California	4,666,270	$25	25c	2-15-41	1.05	1.25	1.47	19¾	15⅛	22½	17⅛
29⅞	22¾	28¾	28	28¾	Union Tank Car Co.	1,177,381	N.P.	45c	12-2-40	1.30	2.07	1.16	24¼	20⅛	23½	20
3⅝	1¾	1⅞	1¾	1⅞	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.77	.52	4¼	2⅜	3½	1⅝

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 4 per cent in stock. ‖Also 2½ per cent in stock. ¶Also 1½ per cent in stock. —Deficit.

New York Curb Exchange

1940 High	1940 Low	Week ended Jan. 4 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1939	1938	1939 High	1939 Low	1938 High	1938 Low
10¾	4½	7⅛	6¼	6¼	American Republics Corp.	1,308,049	$10	25c	12-18-40	....	$0.14	—.22	11¾	5½	11¾	5
3¼	1⅜	1¾	1½	1¾	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.95	—.14	7¼	2½	10¼	4⅞
43	28	40	39½	40	Buckeye Pipe Line Co.	200,000	$50	$1	12-14-40	$2.50	3.13	2.36	34¾	26½	39	22½
117	105	..	..	..	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	12-16-40	6.00	7.87	5.32	130	108⅝	128	97
6¾	4	4⅞	4½	4¾	Cities Service (new)	3,703,978	$10	....	6-1-32	....	.68	.23	9¼	4¼	11	5⅛
2⅛	⅝	⅞	¾	⅞	Cosden Petroleum	465,332	$1	....	.....	....	..	..	2¼	½	2⅜	⅞
24¼	11⅝	14	12½	13¾	Creole Petroleum	6,974,356	$5	50cSA†	12-16-40	1.00	1.38	1.64	28	16¾	27½	17½
4¾	2⅞	4	3⅞	4	Darby Petroleum	351,390	$5	25cSA	1-15-39	.25	.03	.69	7⅛	3⅝	10¼	5½
2	¾	1	1	1	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.37	—.91	2⅝	1½	3½	1½
31	20¼	21¼	21¼	21¼	Eureka Pipe Line	50,000	$50	50c	11-1-40	2.00	.63	—.37	23	15⅛	31	16
39⅞	25⅛	33¾	32¼	33	Gulf Oil Corp.	9,076,202	$25	25cQ	12-27-40	2.00	1.69	1.43	45⅛	29¼	46⅞	33
68	47⅛	63	61⅛	62	Humble Oil & Refining	8,987,840	N.P.	62½c	12-26-40	2.00	3.33	3.98	71	52½	72⅝	56
12⅜	5⅜	6⅛	5⅝	6⅛	Imperial Oil of Canada	26,965,078	N.P.	25c	12-2-40	1.00	.71	.96	17	11⅜	19½	14⅛
7¾	3	3⅜	3⅜	3⅜	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	.50	.33	.47	7¼	5½	9⅜	6
19¾	8¼	9⅜	8¾	9⅜	International Petroleum	14,324,088	N.P.	50c	12-2-40	1.75	1.19	1.98	27½	17	31¼	21
2¾	1⅝	1⅞	1¾	1⅞	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.06	.14	3¾	2⅛	5	2⅛
10¾	7⅝	9½	9¼	9½	Lone Star Gas	5,518,347	N.P.	30c	12-21-40	.70	.98	.88	10½	7⅛	10⅜	6⅝
6¼	3¾	4⅝	4⅛	4½	Louisiana Land & Exp.	2,966,762	$1	5c	12-16-40	.35	.22	.45	7¾	4	9⅝	6½
17	9¼	..	..	..	Margay Oil Corp.	149,943	N.P.	25cQ	1-10-41	1.00	1.52	2.28	17	14½	24	16
8½	6½	8	7¾	8	Midwest Oil Co.	998,474	$10	45c	12-16-40	.90	.99	.93	8¾	6⅝	9¾	6⅝
6¼	4⅞	5¾	5⅛	5½	Mountain Producers	1,593,584	$10	30cSA	12-16-40	.60	.70	.62	6	4⅞	5¾	4½
13⅛	10	12	11½	12	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-31	1.00	.95	.84	14	11¼	14⅝	11½
12½	8¾	10⅜	10¼	10¼	National Transit	509,000	$12.50	50c	12-16-40	.95	.91	.88	9½	7¼	9¼	6½
1¼	¾	1	1	1	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1⅜	1	2⅝	1½
7¾	5¼	6¼	6¼	6¼	New York Transit	100,000	$5	25c	9-20-40	.40	.88	.16	6	4	4½	3½
9⅞	6	8¼	8¼	8¼	Northern Pipe Line	120,000	$10	40c	12-2-40	.30	.31	.24	7	4½	6	4
5½	2½	3¼	3	3¼	Pantepec Oil	2,856,872	$1	....	.....	....	....	....	7⅝	4	7¾	3½
3¼	1¼	..	..	..	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.70	.17	5	1¼	4½	1⅝
3	1½	2½	2	2	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.16	.29	3	1⅞	4	2⅛
11¾	4¾	..	..	..	Southern Pipe Line	100,000	$10	25c	9-3-40	.30	.25	—.27	4⅞	3½	5⅜	3¼
44	28	38½	38	38½	South Penn Oil	1,000,000	$25	$1.87½†	12-20-40	3.00	2.84	1.44	40½	26¾	39	28¾
35	21	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50c	12-26-40	2.00	2.06	—.41	23	18	22¼	16½
20⅞	16½	20	19¼	20	Standard Oil of Kentucky	2,604,790	$10	55c†	12-16-40	1.30	1.53	1.45	20⅛	17¼	18⅜	15
41¾	26¼	40	38	39	Standard Oil of Ohio	753,740	$25	$1.25†	12-14-40	1.50	6.64	1.81	32¾	17	22⅜	16¼
2	1⅜	1⅝	1½	1⅝	Sunray Oil	1,975,376	$1	5c	12-20-40	.10	.25	.23	2⅜	1⅜	3¼	2
3⅛	2	3	2¾	3	Texon Oil & Land	936,024	$2	10c	12-30-40	.10	.49	.56	4	2⅝	5¼	3½
3⅜	2	2½	2⅛	2½	Transwestern Oil Co.	750,000	$10	....	.....	....	—1.42	.12	6	2½	5¼	2⅝
2⅛	¾	⅞	¾	1⅛	United Gas Corp.	7,818,959	$1	....	.....	....	—.55	—.51	3⅜	1½	5¼	2⅝

†Includes extras. —Deficit.

EQUIPMENT PROGRESS...

G-E Polyphase Induction Motor Is of New Design

As a result of a broad survey of changing requirements of its industrial customers, General Electric announces an entire line of completely new polyphase induction motors, in integral horsepower sizes, to conform with new industrial trends, processes, and practices. Known as the Tri-Clad motor and representing one of the most extensive product changes in the history of the company, it has called for many new methods in G-E motor manufacturing.

In all its ratings it features modern streamlined appearance; more complete protection—through the use of a cast-iron frame—than heretofore available except in especially enclosed machines; major advances in the insulation of current-carrying parts; and improved bearing design and lubricating arrangements. At the same time, it incorporates the cast-aluminum rotor, pressure-relief system of greasing for ball-bearing motors, and other proven features. In addition, however it offers many new convenience features.

In recent years there has been an increasing and widespread demand for more protective features in open, general-purpose motors. Thus, despite its striking modern appearance, major industrial interest in the new G-E motor will undoubtedly center around its outstanding mechanical and electrical protective features. In place of the conventional open frame, it makes use of a cast-iron frame of the box type. The end shields are designed to match the frame and are enclosed above the center line.

This combination of frame and end shields minimizes contact of vital motor parts with foreign material such as lubricants, coolants, and other liquids, as well as chips, tacks, etc., while also protecting it against accidental blows in handling or similar rough usage. The new-type insulation, dust-tight bearings, and the use of Glyptal in the priming and finishing paints armor it against the attack of harmful agents.

BUSINESS NOTES

John A. Gillan of National Geophysical Co. succeeds Henry Salvatori as president of that company upon the latter's retirement effective January 1, 1941. Mr. Gillan will headquarter at the company's Dallas, Tex., office in the Tower Petroleum Building.

In connection with its program of expansion, James P. Marsh Corp., 2073 Southport Avenue, Chicago, has announced the appointment of James Emmett, Jr., as assistant sales manager; O. W. Hage as manager of the gage division; and E. C. Kluger as manager of the heating division. Messrs. Emmett, Hage and Kluger have all been with the company for a number of years and are well acquainted in the oil trade.

Pilley Packing & Flue Brush Manufacturing Co. recently moved its offices and factory from St. Louis, Mo., to Fort Madison, Iowa. The company has recently constructed a new plant at Fort Madison where its line of flue brushes and scrapers, bearing scrapers, packing tools, wire brushes, and other products will be manufactured.

Lane-Wells Co. House Organ Appearing in New Format

"Tomorrow's Tools—Today," published by Lane-Wells Co., technical oil-field services, is appearing in a new format beginning with the January 1941 issue.

The magazine, which has a circulation of 10,000 copies among oil-company engineers and field operators, has published development articles about Lane-Wells gun perforator, electrolog and oil-well-survey services, and complete abstracts of all drilling and production papers appearing in current petroleum magazines. These two departments will be retained and new features will be added. Interesting stories and photographs, supplied by leading national outdoor publications, will appear regularly. Front cover plates will be reproductions of outstanding oil-company house organs. A puzzle contest and a picture contest will be included.

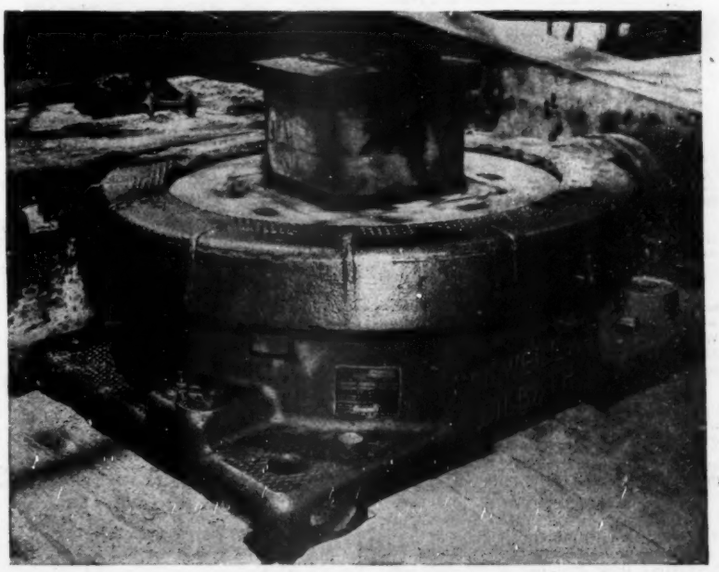
"Tomorrow's Tools—Today" has been published regularly since 1934 and is considered by Lane-Wells as an important contact between the company and its customers.

Rockenbough Appointed McEvoy Representative in North Texas

McEvoy Co., Houston, Tex., announces the appointment of G. T. Rockenbough as sales representative for the North Texas and Oklahoma territories. His headquarters will be at 1714 Collins Street, Wichita Falls, Tex. Mr. Rockenbough has had 16 years experience in various fields in Texas, Oklahoma and Kansas and has specialized in handling surface-control and completion equipment. Working under the various conditions encountered in these several fields he has become thoroughly familiar with all completion and control problems encountered in the industry.

"OILWELL" MANUFACTURING 17½-IN. OIL-BATH ROTARY

Oil Well Supply Co., Dallas, Tex., now manufactures the new "Oilwell" 17½-in. oil-bath rotary, recommended for speeds up to 400 r.p.m. and a maximum drilling depth of 7,500 ft. New features include a fully heat-treated, forged-steel, spiral-bevel gear train with the pinion given an additional surface hardening. The spiral-bevel design results in smooth and quiet operation and is especially suitable for high-speed service. The main bearing is of self-centering, high-speed, ball-and-race design with high-precision, large-diameter steel balls and surface-hardened, heat-treated and ground steel races. An extra-wide, heavy-duty, bronze radial and holddown bearing is fitted low in the base for greatest steadying effect and maximum wear resistance.



Circulating oil-bath lubrication is provided for the gear train, main bearing, and holddown bearing. These parts operate in a complete enclosure with a perfected labyrinth seal. The oil reservoir extends completely around the table. The holddown ring forms a cylindrical container with the top overlapping the oil-retainer ring, assuring continuous circulation and complete return of the lubricant.

The large-diameter pinion shaft is a high-carbon steel forging, heat-treated for maximum toughness. It rotates in a double-row, heavy-duty tapered roller bearing and a heavy-duty straight roller bearing. These bearings are mounted in separate, cylindrical, steel housings which are solidly supported in circular bearing supports integral with the base, assuring perfect alignment at all times. Pinion-shaft bearings are lubricated through Alemite connections, and the housings are provided with oil seals and pressure-relief fittings.

Skids, table enclosure, oil reservoir, and pinion-shaft bearings supports are integral with the rigid, one-piece, cast-steel base. The table top is flat and low, and is covered at its circumference by a reinforced steel guard with diamond-pattern safety tread and sloping sides. In addition to its safety feature, the guard prevents the slinging of mud onto the derrick floor.

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

J. PRESTON SWECKER
PATENT LAWYER
INFRINGEMENT LITIGATION
Patents, Searches, Opinions, Trade Marks
OFFICES
311 Panhandle Bldg., Wichita Falls, Tex.
National Press Bldg., Washington, D. C.

CECIL L. WOOD
PATENT LAWYER
Patents, searches and opinions
Infringement practice
Experience in Oil Equipment
323-324 Insurance Bldg., Fort Worth, Tex.
212 Kellogg Building, Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

NEW MEXICO
STATE OIL AND GAS LEASES

Another block in a NEW HOT SPOT. This is a good bet. Buy direct and save those dollars. No middle man to pay; no salesman to bother you. Better to buy a little of something, than a whole lot of nothing.

HARRY S. WRIGHT
New Mexico State Lessee
Farmington, New Mexico

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W.P. HARLEY, Bowling Green, Kentucky.

NEW MEXICO
Oil and Gas Leases and Royalties
ROY G. BARTON, Hobbs, N. M.

100 ACRES, sale or lease, Liberty Co., Texas, by owner. Mr. Juelfs, 28 W. Ashley, St., Jacksonville, Fla.

HOMER L. FITCH, GEOPHYSICIST AND LOCATION ENGINEER

WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

WILL take $7500.00 cash for ½ interest in 3000 acres oil leases and drilling well, half completed, good geology, on West Texas Structure, six formations to 3250 ft. depth. Address Owner, 610 Wilson Building, Dallas, Texas.

3000 A. near Cities Service Pool, Phillips County, Kans. For leases or royalty write J. D. SEARCH, Logan, Kansas.

WANTED—Some one to finance drilling and developing oil wells on our farms. Creasey Brothers, R.F.D., Dalton, Ky.

MISSISSIPPI
SALESMEN, BROKERS, Cheap Lands in fee with all mineral rights in well located counties where Major companies have large lease holdings. Write Box 754, Jackson, Mississippi.

FOR SALE: South Florida subdivision of (210) lots, consider some trade. Mr. Juelfs, 28 W. Ashley Street, Jacksonville, Florida.

REAL Bargains In Shelby County Leases. One-fourth royalty interest under 49-acre lease, Humble block, $100. Fifteen-acre lease in Joaquin field. Twenty-five acres adjoining Reddett and Gray wells. Two thousand-acre drilling block. Write for map and information. C. A. PARKER, Box 451, Center, Texas.

Business Opportunities

NEED SALES REPRESENTATION? Can handle few more outstanding oil-field trade items. Fine clientele. Box A-282, The Oil and Gas Journal, 617 Petroleum Bldg., Fort Worth, Texas.

SOMETHING NEW

Building fireproof filling stations, warehouses, low cost homes and tourist camps. Year round income. Just pour concrete in steel forms. Inexperienced labor can build at warehouse. Manufacturers rights now available for Oklahoma, Texas, Kansas, Arkansas, Pennsylvania, New Mexico, Illinois and California. Address: Peter J. Minck, 410 North Meridian Street, Indianapolis, Indiana.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Geologic Survey

GEOLOGISTS—SURVEYORS

Looking for U. S. or State Geologic Surveys, or other government publications? Write Cornwall's Book Store, 723 Eleventh Street, Northwest, Washington, D. C. Unusually large stock.

Survey Service

REMEMBER EAST TEXAS

"When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2 first producer Wilmington, Calif., field, located by this method. Not theoretical prognostications. Approximate depths and thickness of sands given. I own production. Information to prospective operators, only. George Miller, 1548 Post, Torrance, California."

For Sale

MAN'S new bearskin overcoat. Cost $350.00. Would make into wonderful rug for den. Sell at discount or trade for gasoline books. 426 No. Santa Fe, Tulsa, Okla.

Financing

DEVELOPMENT loan or advance negotiated on commission basis for a matter of exceptional merit. Box 5411, Philadelphia.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Iquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

WE MAINTAIN A MARKET FOR REGISTERED DEALERS IN ALL FORMS OF OIL INVESTMENTS
FIRST DEPENDABLE OIL CORP.
522 Fifth Ave., New York, N. Y.

Oil Industry Printing

OIL FIELD LEGAL BLANKS

Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS

Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD Fox Theater Building, Detroit, Michigan

INQUIRIES SOLICITED from Capital Seekers who have worthy projects, by house with excellent facilities. Moderate charges, confidential. Brown Hartwell Company, 110 E. 42nd St., New York.

For Sale—Equipment

FOR SALE: At Bartlesville, Oklahoma, 1—50 HP Kewanee locomotive type boiler with stack 150# WP. Will pass state inspection. $200.00. I. T. I. O., Bartlesville, Okla.

FROM REFINERY equipment we offer 1—ten thousand barrel riveted tank, 2—Scotch Marine Boilers, 2—6' x 40' Bubble Towers, 1—5' x 51' Bubble Tower, 2—5' x 40' Flash Towers, 300—4" Still Header Boxes, 1—6' x 96' Smoke Stack, 2—18 x5 x 18 Pumps, 1—10 x 6 x 24 Worthington Simplex Hot Oil Pump, 1—22 x 36⅝ x 6 x 24 Wilson Snyder Duplex Hot Oil Pump, 3—85 HP Diesel Engines, 1—Cracking Furnace, brick, castings, and structure, 1—Exhaust Steam Heater.
Box 1011 — Mt. Pleasant, Texas.

FOR SALE: At Oklahoma City 2—set slightly used 6½" Spang Weldless drilling jars 4⅛" stroke 3¼"—4¼" box and pin, $100.00 per set. I. T. I. O., Bartlesville, Okla.

FOR SALE—$300 EACH
6 Good 12" x 12" Twin Steam drilling engines, Ideals—Luceys—Johnsons.
LUCEY PRODUCTS CORPORATION
Tulsa, Okla.

FOR SALE: In Oklahoma City field 50—1000 barrel BS&B VP used oil storage tanks, Cheap. I. T. I. O., Bartlesville, Oklahoma.

RECEIVER'S SALE

5 fully equipped producing gas wells, 6 producing oil wells, 3 equipped non-producing oil and gas wells. National Drilling Machine, tools and miscellaneous equipment. Leasehold rights on 174 acres. Room for Additional Development.
SALE — WEDNESDAY—JANUARY 15, 1941—1:00 P.M. on Premises 5 miles South of St. Clairsville, Ohio. For details write Carter Thornburg, Receiver, The Richland Developing Association, St. Clairsville, O.

FOR SALE: 4 — OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

FOR SALE—Gasoline Plant Equipment. Bessemer Engines & Compressors, large stock of pipe, pumps, tanks, meters, etc. Gilbert Pipe & Supply, Electra, Tex.

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

BEECHCRAFT airplane, 330 H.P. Jacobs engine, constant speed propeller, all blind flying equipment, including Sperry group, radio compass, 6 frequency, 50 W transmitter, vacuum pump and many extras. New May, 1939, modernized, engine majored recently at 200 hours with all new modifications. Total time 230 hours. Cost new as equipped $18,000. Will sell for $10,000 or will sell less instruments at corresponding reduction. W. G. GREEN, 624 East 4th, Tulsa, Oklahoma.

FOR SALE—One 84 ft. angle iron derrick with crown block and steel bull wheels. Carl T. Matthews, Hominy, Oklahoma.

INTEGRATOR — EMCO - McGAUGHY MAKE—IN GOOD CONDITION, ATTRACTIVE PRICE. U. & I. SUPPLY CO., JACKSON, MICH.

FOR SALE: 1—No. 28 Star steam drilling machine 60' mast serial C 507, less tools, located near Wynona, cheap. I. T. I. O Co., Bartlesville, Okla.

FOR SALE: 2500 Barrel Pipe Still, Tower, Condensers, etc., complete. A-1 condition. P. O. Box 568, Warren, Pa.

FOR SALE: At Wynona, Oklahoma—1 Twin and 2 Single Cooper gas engine type "S" compressor units with double acting cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

TRACTORS

Caterpillars, crawler type, size "35," $375; size "65" with nigger-head winch, $750; Caterpillar RDS with bulldozer, $2000; Allis-Chalmers Model L with bulldozer $1750. Guaranteed, slightly used. O. C. Evans, Mt. Sterling, Ky.

FOR SALE: At Oklahoma City—9—80 HP 180 RPM 2 cycle type "10" Bessemer Engine Compressor units with tandem cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE. MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

FOR SALE

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.

300 sets 3" A.P.I. tool joints.

10,000 Ft. 7" O.D. 26# seamless casing, once run.

15,000 Ft. 4½" O.D. seamless drill pipe equipped with both regular and full hole tool joints.

In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, La.

FOR SALE: At Bartlesville 1—2A National Portable Drilling Machine Less Tools. I. T. I. O. Co., Bartlesville, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.

Terms to suit.

CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: At Oklahoma City—1 Toledo electric power drive complete with 60 cycle single phase 110-volt A.C. motor. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE

30-TON S/G LIMA GASOLINE, 0-4-0 SWG. LOCO. NEW 1931, GOOD COND. ROLLER BEARING. Immed. Delivery.
SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES

IRON & STEEL PRODUCTS, INC.
36 years' experience
13412 S. Brainard Ave.
Chicago, Ill.
***"Anything* containing IRON or STEEL"**

FOR SALE: At Oklahoma City—1 Brauer shale separator, steam operated. I. T. I. O. Company, Bartlesville, Oklahoma.

USED OIL TRUCKS

Mack—Diesel train—6300 Gallons.
Diamond T—6 wheeler—3000 Gallons.
Diamond T—6 wheeler—1500 Gallons.
International—Completely equipped—1200 Gallons.
International A7F—10 to 15 ton—6 wheeler.
Diamond T Model 1600—10-12 tons 6 wheeler.
Diamond T Model 1203—10 ton—6 wheeler.
Diamond T—6 wheeler—2600 Gallons.
Fruehauf Trailer — 3000 Gallon tank.

National Truck Sales, Inc.
3315 Archer Avenue, Chicago, Ill.

WANTED TO BUY

All Sizes Storage Tanks—Wood or Steel Roof—10,000 bbl. to 80,000 bbl.
Abandoned Plants—Natural Gasoline, Oil Refineries, etc.
Send us lists of your surplus material and equipment

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry and H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

FOR SALE—At Seminole, Oklahoma—1 8' diameter X 26' gasoline steel storage tank. I. T. I. O. Company, Bartlesville, Oklahoma—$200.00.

FOR SALE

ANY QUANTITY
NEW SEAMLESS STEEL COUPLINGS

750—13" O. D. (12¾" Pipe) 8-V Thread x 8¼" long, Line, at $1.35 each.
3000—1¼" Black Merchant Forged Steel, at 4c each.
2500—1½" Black Merchant Forged Steel, at 5½c each.
6000—1¼" Galv. Merchant Forged Steel, at 5¼c each.

RECONDITIONED PIPE

30,000 feet 12", 50 lb. at $1.25 per foot.
80,000 feet 6" Std. at 38c per ft.
All of the above F.O.B. Philadelphia District, subject to prior sale. Pipe in lengths 18'0" and longer, plain ends.

EASTERN PIPE SUPPLY COMPANY
1424 N. NINTH STREET
PHILADELPHIA PENNA.

FOR SALE—At Oklahoma City—11 6" and 8" Byron-Jackson built-in motor pump heads for use in operating deep-well turbine pumps. I. T. I. O. Company, Bartlesville, Oklahoma.

YOUR dependable and cheapest source of supply!
Tank & Freight Cars; any kind
Tank & Freight Car Repair Parts;
Locomotives; All Kinds
Relaying Rails

Perhaps *we* can supply your requirements and—immediately!
OTHER MACHINERY AND EQUIPMENT TOO!
Destination inspection if desired!

IRON & STEEL PRODUCTS, Inc.
36 years' experience
13412 S. Brainard Ave., Chicago, Ill.
"Anything containing IRON or STEEL"
Ask to be placed on our various mailing lists.

REFINERY GATE VALVES

Reconditioned and Tested
STEEL and CAST IRON
O.S.&Y. Flanged and Screw End
ALL STANDARD MAKES
Largest Stock in Midwest
We save you half

West Tulsa Pipe and Supply Co.
L.D. 635 P.O. Box 1865
TULSA, OKLAHOMA

FOR SALE OR LEASE
Any part of 50 tank cars. Pennsylvania Oil Products Refg. Co., Warren, Pa.

FOR SALE: 1—Ideco Portable Standard Rig suitable for drilling, pumping, or servicing, complete less motor. I.T.I.O., Bartlesville, Okla.

Situations Wanted

CHIEF CHEMIST—Process Supervisor. M. I. T. graduate. Experienced in manufacture of gasoline, lube oils, greases, asphalts, waxes, specialties. Fifteen years' experience. Address Box A-300, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL Engineer, long executive experience, maintenance and process development. Specialist on coking. A. L. Miller, 1824 Wynnewood Rd., Philadelphia, Pa.

OIL COMPANY LIAISON
Versatile and diligent young man with diversified experience and association with international petroleum industry qualifies for position with progressive independent or major oil company as executive's aide-de-camp—Can conduct liaison; carry on statistical, economic and technical surveys and investigations; manage production of house organs; assist in public relations; prepare company reports and speeches; rather good at conjuring information of the hard-to-get kind. Anglo-Saxon; good educational and family background; fine references; quiet; personable. Box A-311, The Oil and Gas Journal, 415 Lexington, New York.

GRADUATE PETROLEUM ENGINEER
With ten years' experience in production and sales work wants connection with a producing company or a major servicing or supply company. American, 35 years old.

Box A-310
The Oil and Gas Journal
Tulsa, Okla.

WANTED TO BUY

Lots of Extra Heavy, Double Extra Heavy, and Hydraulic Pipe, in new and second-hand. Advise what you have, quantity, lengths and condition.

EASTERN PIPE SUPPLY COMPANY
1424 N. Ninth Street
PHILADELPHIA PENNA.

Ranches—Farm Lands

56,000 ACRES—$8.00

56,000 acres of good ranch land, 85% agricultural, now stocked with 3,000 head of steers, on highway, modern 10 room house, lights, telephone like in city. Is divided into 9 pastures, 4 wells, 21 troughs, 38 large tanks; a paradise for wild game, deer, quail, ducks, and fish. Has good geology, mineral, and oil rights intact; hilly part of ranch has abundance of coal. W. H. Wilson, Carrizo Springs, Texas.

FOR SALE: Beautiful Historical California Ranch, 800 A. Semi modern, improved. Live Oaks, springs, etc. Good roads; 26 miles east San Diego. Snap $36,000. 2644 Rimpau Blvd., Los Angeles.

Mailing Lists

ROYALTY owners, Oil Investors, Unit holders, Stockholders in Oil and Royalty Companies. Personnel lists of every branch of oil industry. All by States. We buy lists. New catalogues ready. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

Help Wanted

WELDING Engineer, graduate metallurgist with experience in fabrication procedure and welding practice. State acceptable salary. Battelle Memorial Institute, Columbus, Ohio.

CHEMICAL Engineer for equipment maintenance and process study at small refinery. Experienced man preferred. Address Box A-312, The Oil and Gas Journal, Tulsa, Oklahoma.

Crude-Oil Price Changes

A general crude-oil price advance of 10 cents per barrel, excepting production from fields in the western part of the state, was posted January 2 by Michigan buyers. The advances elevated affected Michigan crudes to a 3-year high. The Pure Transportation Co. and Simrall Corp. instituted the Michigan advance.

Bay Pipe Line Co. posted a flat price of $1.48 for high-gravity distillate production from Gulf Refining Co. 1 Bateson, the deep discovery in Monitor Township, Bay County, which is yielding approximately 80 bbl. daily.

Sohio Corp. raised Birk City, Ky., crude 5 cents January 1.

Placid Oil Co. (H. L. Hunt) increased its posted price January 3 for Tullos and Urania crude in La Salle Parish, Louisiana, 6 cents making the new price 95 cents.

Arkansas Fuel Oil Co. (Cities Service) met the increase of 6 cents in the Urania-Tullos field.

New Mexico crude producers received the equivalent of a 2 per cent increase in prices January 1 when practically all buyers announced they would pay for future deliveries on a basis of 100 per cent of tank tables against the basis of 98 per cent previously obtaining.

Continental Oil Co. readjusted its postings for several Southwest Texas fields reducing some of the high-gravity crudes 20 cents per barrel in line with Republic Oil Refining Co.'s reductions a month ago. A schedule ranging from 93 cents a barrel for crude of 20-20.9° gravity up to $1.13 for 40 and above was posted January 1 for the Clara Driscoll, South Clara Driscoll, Driscoll Ranch and Minnie Bock fields. A flat price of $1.08, down 20 cents, was posted for the Alfred and Magnolia fields in Jim Wells County, Texas. New prices in the middle western states are shown below:

Middle Western States

OHIO OIL CO.
(Effective August 21 and 23, 1940)

Illinois old fields	$1.00
Illinois basin	1.15
Illinois (Storms field) (Nov. 1, 1940)¶	1.05
Princeton, Ind.	1.00
Western Kentucky (Aug. 21, 1940)†	1.10
Birk City, Ky. (Jan. 1, 1941)¶	.95
Corydon, Ky. (June 9, 1939)	.90
Greendale, Porter, Crystal, Vernon and Wise. Mich. (Jan. 2, 1941)*‡	1.22
Buckeye, Bentley, Monitor (sweet crude), Edenville, Beaverton, Mich. (Jan. 2, 1941)*	1.20
Freeman-Redding and Lincoln (Jan. 2, 1941)*‡	1.17
West Branch, Adams-Arenac, Mich. (Jan. 2, 1941)*‡	1.02
Hamilton-Grout, Mich. (Jan. 2, 1941)*	1.07
Allegan-Kent and Ottawa, Mich. (Aug. 25, 1940)	1.18
Bloomingdale and Columbia, Mich. (Nov. 1, 1940)¶	1.18
Muskegon	1.00
Sherman and Freeman, Mich. (Aug. 25, 1940)‡	1.17
Midland, Mich. (Jan. 2, 1941)‡	1.22
Eastern Kentucky:	
Big Sandy River (Aug. 21, 1940)†	1.12
Kentucky River (Aug. 21, 1940)†	1.20

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. ¶Sohio Oil Co. Bloomingdale posted by Tri-Lakes Corp. Kent County by Naph-Sol Refining Co. On May 25, 1940, Sohio posted $1 per barrel in the Griffin field in Gibson County, Indiana, and Wabash County, Illinois, and the North Griffin, South Griffin, Phillipstown, New Harmony and Irons in Wabash and White counties, Illinois. Allegan, Kent and Ottawa posted by Commonwealth Pipe Line Co.

INDEX TO ADVERTISERS

A

Abercrombie Pump Co.
AC Spark Plug Division of General Motors Corporation
Acme Fishing Tool Co.
Aero Exploration Co.
Air Reduction Sales Co. 1
Ajax Iron Works
Alco Products Division of American Locomotive Company
Allied Steel Products Corp.
Allis-Chalmers Mfg. Co.
Allison, R. J.
American Blower Corporation
American Bosch Corporation
American Cable Division of American Chain & Cable Co., Inc.
American Cast Iron Pipe Company
American Hoist & Derrick Co.
American Iron & Machine Works
American Locomotive Company, Diesel Engine Division
American Meter Company
American Roller Bearing Co.
American Rolling Mill Co., The
American Steel & Wire Company
Armstrong Bros. Tool Co.
Armstrong Machine Works 80
Ashcroft Gauge Division 79
Athey Truss Wheel Co.
Auer, C. L., and W. W.
Austin-Western Road Machinery
Axelson Manufacturing Company

B

B and M Construction Corp.
Baash-Ross Tool Company
Babcock & Wilcox Tube Company, The
Badger & Sons Co., E. B.
Baker Oil Tools, Inc. 6
Baldwin-Duckworth Division of Chain Belt Company
Ball Valve Seat Grinder Co., The 78
Bantam Bearings Corp.
Baroid Sales Division, National Lead Company
Barret, William M., Inc. 89
Beaird Corporation, J. B. 83
Bethlehem Supply Company
Bethlehem Steel Co.
Braden Steel Corporation
Brance-Krachy Co., Inc.
Brauer Machine & Supply Company
Brewster Company, The
Bridgeport Machine Company, The
Bristol Company, The
Broderick & Bascom Rope Co.
Brodie Co., Ralph N.
Brown Instrument Company, The
Bruning, Charles Co., Inc.
Buck Clamp Company 78
Buckeye Traction Ditcher Co.
Bucyrus-Erie Co.
Buda Co., The
Burgess Battery Co.
Butler Manufacturing Co.
Byron Jackson Co.

C

Cable, Jo H. 83
Cameron Iron Works, Inc.
Cardwell Mfg. Co., Inc.
Carey Company, The Philip
Carnegie-Illinois Steel Corporation
Cast Iron Pipe Research Association, The 28
Caterpillar Tractor Co.
Cavins Company 80
Century Electric Company
Cessna Aircraft Company
Chain Belt Company
Chaplin-Fulton Mfg. Co., Inc.
Chapman Valve Mfg. Co., The
Chemical Process Co., Inc., The
Chevrolet Motor Division, General Motors Sales Corporation
Chicago Bridge & Iron Company
Chiksan Tool Co. 81
Clark Brothers Company
Classified Advertising 98-99
Cleveland Trencher Company
Climax Molybdenum Company
Columbia Steel Company
Columbian Steel Tank Co.
Continental Motors Corp.
Continental National Bank of Fort Worth
Continental Oil Co.
Continental Supply Company, The 23
Cooper, Fred E.
Cooper-Bessemer Corp., The
Coppus Engineering Corp.
Core Laboratories, Inc.
Crane Co.
Cummins Engine Co.
Crutcher-Rolfs-Cummings
Curtin, W. H. & Co., The

D

D & M Machine Works
Darling Valve & Mfg. Co.
Davis Regulator Mfg. Co., The
Dayton Rubber Mfg. Co., The
Dearborn Chemical Co.
Dempsey-Wilson Construction Co.
Diamond Chain & Mfg. Co.
Dodge Division, Chrysler Corporation
Dow Chemical Company, The
Dowell Incorporated
Dragon Mfg. Co., The
Dresser Mfg. Co., The 45
Drilling Equipment Directory 66
Duff-Norton Manufacturing Co., The
Du Pont de Nemours & Co., Inc.
Durametallic Corp.

E

Eagle-Picher Lead Co.
Eastman Oil Well Survey Co.
Economy Electric Lantern Co.
Elastic Stop Nut Corp.
Electrical Facilities, Inc.
Emsco Asbestos Company 80
Emsco Derrick & Equipment Company
Engineering Laboratories, Inc.
Engineers & Fabricators, Inc.
Ensign Carburetor Company, Ltd
Ethyl Gasoline Corporation

F

First National Bank of Fort Worth
First National Bank in Houston
First National Bank & Trust Co. of Tulsa, The
Fisher Governor Company
Fluid Packed Pump Co.
Fluor Corporation, Ltd., The
Ford Motor Co.
Fort Worth Chamber of Commerce
Fort Worth Clearing House Association
Fort Worth National Bank, The
Foster Wheeler Corp.
Foxboro Mfg. Co., The
Franks Mfg. Co.
Frick-Reil Supply Corporation

G

Gardner-Denver Company
Garlock Packing Company, The 74
Gaso Pump & Burner Mfg. Co.
Gasoline Products Co., The
Gates Rubber Co., The
Gatke Corporation 80
General American Transportation Corporation—Terminal Division
General Electric Company
General Paint Corporation
General Power, Inc.
Geological Scientific Service Company
Geophysical Service, Inc.
Gilmer Company, L. H.
Girdler Corporation, The
Goodall Rubber Co.
Goodrich Company, B. F., The 3
Goodyear Tire & Rubber Co.
Gott, H. P., Mfg. Co.
Grant Oil Tool Co.
Graver Tank & Mfg. Co., Inc.
Gray Processes Corporation, The
Great Lakes Steel Corporation
Green Head Bit & Supply Co.
Guiberson Corporation
Gulf Oil Corp. 35
Gulf States Utilities Co.
Gustin-Bacon Mfg. Co.

H

H & M Pipe Beveling Machine Co.
Halliburton Oil Well Cementing Co.
Hanlon-Buchanan, Inc.
Hanlon-Waters, Inc.
Harnischfeger Corporation
Harrisburg Steel Corporation
Hazard Wire Rope Division of American Chain & Cable Co., Inc. Inside Back Cover
Hewitt Rubber Corp.
Hill-Hubbell & Co.
Houston Engineers, Inc.
Houston Oil Field Material Co.
Houston Pipe Appliance Co.
Hughes Tool Co. Back Cover
Humble Oil & Refining Co. 57
Hydril Co. Front Cover

I

Independent Exploration Company
Industrial Engineering Co.
Inferno Co., The
Ingersoll-Rand Co.
International Harvester Co.
International Nickel Company, Inc., The 4

J

Jacobson, E. C., Maps
Jadson Motor Products Company
Jarecki Manufacturing Company
Jensen Brothers Manufacturing Co.
Jerguson Gage & Valve Co.
Johns-Manville Corporation
Jones Company, The S. M.
Jones & Brooks, Inc.
Jones & Laughlin Steel Corporation

K

Keeley Institute, The
Kellogg, M. W., Company, The
Kennedy Valve Mfg. Co., The
Kerotest Manufacturing Company
Keuffel & Esser Co.
Kev Company
Kobe, Incorporated

L

Laminated Shim Company, Inc.
Landis Machine Company, Inc.
Lane-Wells Company
Larkin Packer Company, Inc. 27
Lavne & Bowler, Inc. 89
Leeds & Northrup Co.
Le Roi Company
Leschen, A., & Sons, Rope Co.
Lincoln Electric Company, The
Line Scale Co., Inc.
Link-Belt Company
Lockheed Aircraft Corporation
Lone Star Cement Corporation
Long, S. A., Co., Inc.
Lucey Export Corporation
Ludlow Valve Mfg. Co., The
Lufkin Rule Co. 79
Lummus Co., The
Lunkenheimer Co., The

Mc

McEvoy Company 74
McGregor Working Barrel Company
McKissick Products Corp.

M

MacClatchie Manufacturing Company 80
Macwhyte Co.
Magnolia Airco Gas Products Co. 1
Maloney Tank Mfg. Co.
Manhattan Rubber Mfg. Division
Manning, Maxwell and Moore, Inc. 79
Marley Company, The
Marmon-Herrington Co., Inc.
Marsh, James P., Corp.
Martin-Decker Corp.
Mayfair Hotel
Medart Company
Meehanite Research Institute
Merco Centrifugal Co.
Merco Nordstrom Valve Co.
Mercoid Corporation
Metric Metal Works
Mid-Continent Engineering Co., Inc.
Mid-Continent Supply Company
Midwest Piping & Supply Company, Inc., The
Milwhite Company, Inc. 52
Miller Sand Pump Co.
Mission Mfg. Co., The 54
Monsanto Chemical Company
Moorlane Co.
Morse Chain Company
Murray Rubber Company

N

National Bank of Tulsa 75
National Carbon Co., Inc.
National Steel Corporation
National Supply Co., The 68-69
National Transit Pump & Machine Co.
National Tube Co. 38-39
Nelson, J. B.
New Bedford Cordage Co.
Newman, Hender & Co., Ltd.
Norton Company
Novo Engine Co.
Nugent, Wm. W., & Co., Inc.

O

O.C.S. Mfg. Co., The
Ohio Injector Co., The
Oil Center Tool Co.
Oil Well Supply Co.
Oliver United Filters, Inc.
Osage Metal Company
Otis Pressure Control, Inc.

P

Page Fence Association
Page Steel & Wire Division of American Chain & Cable Co.
Parkersburg Rig & Reel Co.
Parkhill Truck Co.
Parkhill-Wade
Patterson-Ballagh Corporation 85
Pease, C. F., Company, The
Peerless Pump Division of Food Machinery Corp.
Penberthy Injector Co. 21
Pennington Signaling Core Barrel
Pennsylvania Grade Crude Oil Association
Perco, Inc.
Petroleum Advisers, Inc.
Petroleum Electric Power Association 73
Petroleum Engineering, Inc.
Petroleum Rectifying Company
Petty Geophysical Engineering Co.
Phelps Dodge Refining Corporation
Pittsburgh-Des Moines Steel Company
Pittsburgh Equitable Meter Co. Inside Front Cover
Pittsburgh Steel Company
Plymouth Cordage Co.
Poist Tool Co.
Pomona Pump Co.
Portable Rig Co.
Powell, Wm., Co., The 70
Price, H. C., Co.
Pritchard, J. F., & Co.
Producing Equipment Directory
% Proportioneers, Inc. %
Pure Oil Co.

Q

Quaker Oats Company, The 83

R

Reading-Pratt & Cady Division of American Chain & Cable Co.
Rector Well Equipment Co., Inc.
Reda Pump Co.
Reed Roller Bit Company
Regan Forge & Engineering Co.
Reilly Tar & Chemical Corporation
Republic National Bank of Dallas 71
Republic Rubber Division of Lee Rubber & Tire Corp.
Republic Steel Corporation 65
Rockford Drilling Machine Division of Borg-Warner Company
Roebling's Sons Company, John A.
Ryerson & Son, Inc., Joseph T.

S

Safety Gas Main Stopper Co.
Schlumberger Well Surveying Corporation 49
Sealed Power Corp.
Security Engineering Co.
Seismic Explorations, Inc.
Seismograph Service Corp.
Shafer Bearing Corporation
Shand & Jurs Co.
Shell Development Company 2
Shell Oil Company, Incorporated
Sinclair Refining Company, Inc.
Skinner Co., M. B.
Smith, A. O., Corporation
Smith Company, E. M.
Smith Company, Howard
Smith, H. C., Oil Tool Co. 81
Smooth-On Mfg. Co., Inc.
Socony-Vacuum Oil Co., Inc.
South Chester Tube Co.
Southwestern Gas & Electric Company
Spang Chalfant, Inc.
Spang & Company
Sperry-Sun Well Surveying Co.
Spicer Mfg. Corp. 58
Standco Brake Lining Co.
Stanley Belting Corporation
Star Drilling Machine Co., The
Stearns-Roger Manufacturing Co.
Steel Founders' Society
Stevens Asbestos Products Corp.
Stoody Co.
Sunshine Iron Works

T

Tansel Petroleum Co.
Taylor Forge & Pipe Works
Taylor Instrument Companies 63
Technical Oil Tool Corporation, Ltd.
Texaco Development Corporation
Thermoid Company
Thompson Products, Inc.
Thornhill-Craver Co.
Thornton Tandem Co.
Timken-Detroit Axle Co.
Timken Roller Bearing Company
Timken Roller Bearing Company, Steel and Tube Division
Tobin, Edgar, Aerial Surveys 53
Toledo Pipe Threading Machine Co., The
Tretolite Company 47
Trinity Portland Cement Company
Tru-Line Corporation
Tubbs Cordage Co.
Tube-Turns, Inc.
Tulsa Boiler & Machinery Co.
Twin Disc Clutch Co.

U

Union Wire Rope Corporation
Unit Rig & Equipment Company
United Gas Pipe Line Co.
United Geophysical Co.
United States Rubber Company 60-61
United States Steel Corp., Subsidiaries 38-39
United States Steel Export Company 38-39
Universal Atlas Cement Co.
Universal Engineering Company, Ltd.
Universal Oil Products Co. 24

V

Vickers, Inc.
Viking Pump Co.
Visco Products Company
Vogt, Henry, Machine Co.

W

Walker, W. L., Co.
Wall-Colmonoy Corp.
Wall Rope Works, Inc. 80
Walworth Co.
Warren Petroleum Corporation
Waukesha Motor Co.
Wedge Protectors, Inc.
Well Equipment Manufacturing Corp.
Well Surveys, Inc.
Western Geophysical Company
Westinghouse Electric & Mfg. Co. 42
Wheeling Machine Products Company
Whitney Chain & Mfg. Co.
Wickwire Spencer Steel Company
Wilson Manufacturing Co., Inc.
Wisconsin Motor Corporation
Witte Engine Works 79
W-K-M Company, Inc.
Worthington Pump & Machinery Corporation
Wyatt Metal & Boiler Works

Y

Youngstown Sheet & Tube Co.

The Oil Man's Calendar appears on Page 30